International Commission on the History of Geological Sciences

INHIGEO

ANNUAL RECORD No. 52

Participants of the 44th INHIGEO Symposium; University of Insubria, Como, Italy, September 3, 2019.
Photograph courtesy of Mike Johnston

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INHIGEO Editor

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INHIGEO

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PRESIDENT'S MESSAGE
(April 2020)

Welcome to INHIGEO Annual Record 52 which includes mostly reports of activities during 2019.

My term as INHIGEO President (2016-2020) concludes with this AR following two terms as INHIGEO Secretary General (2008-2016). Our Terms of Reference advise that I must retire following another 4-year Board term as past INHIGEO President.

My term as President has been most enjoyable and I thank all of my fellow Board Members and indeed the entire INHIGEO membership for making it so. Please welcome Ezio Vaccari (Italy) as my successor. In recent years we have had successful conferences with associated field trips in unusual places including South Africa (2016), Armenia (2017), Mexico (2018) as well as Italy (2019), a much-favoured location where Ezio organised the meeting. We have also introduced INHIGEO to new countries as well as increasing membership numbers and Affiliated Associations. INHIGEO is thriving.

The year 2020 has brought an unexpected development with the postponement of our meeting with the 36th International Geological Congress in New Delhi in March 2020 due to the coronavirus matter. As this report moves to publication we look forward to the reinstated meeting in November 2020.

However, already in advance, we have planned the formation of the new INHIGEO Board in August 2020 as well as the 2021 conference in Krakow, Poland.

Of great importance also has been the award of the V. V. Tikhomirov History of Geology Award to David Branagan (Australia) in April 2020. Congratulations, David, on behalf of all INHIGEO.

Finally, I record special personal appreciation of Secretary General: Marianne Klemun, Editor: Bill Brice and Webmaster: Johannes Mattes. There was a period when all these roles were undertaken by the Secretary General. However, the time has come that INHIGEO is dependent on all its office bearers.

To all INHIGEO members, enjoy Annual Record 52. I am especially looking forward to reading it.

Barry Cooper

Secretary- General's Report

As I approach the end of my term in office as Secretary General (2014-2020), I am pleased to look back on some exceptionally positive developments within the INHIGEO and be able to report on the many successes that have been realised over the course of the last year.

The history of science has, on a global scale, seen a considerable upturn and reached wider audiences than ever before, while the history of earth sciences in particular received huge attention in the wake of the public debate on the Anthropocene.

Our commission has faced these challenges in multiple ways, while contributing valuable analyses to the debate. Our members have addressed the many topics of this area in different contexts such as exhibitions, books, collections of documents and digitalisation projects.

Fortunately, we have managed to maintain our membership numbers of around 300, which is particularly notable as quite a few of our older, honourable members passed away over the course of the last year. However, we have successfully prevented the anticipated decline of our membership numbers. Our 2019 ballot was concluded in May 2019, and we have 13 new members from 8 different countries! I warmly welcome our new members! A new generation is emerging within the INHIGEO. A new appointment policy, introduced in 2016, opened our doors to younger scholars and, in doing so, secured the future of our organisation. The former regulation of limiting the number of members per country has also been abolished.

However, our younger colleagues often cannot afford to attend expensive world congresses, such as an IUGS meeting. This has proven to be a difficult and persistent problem. For that reason, the regional conferences organised annually by the 13 "affiliated associations" are of particular importance for the development of the INHIGEO. Instead of focusing merely on respective national members, these activities also involve international colleagues according to their individual research fields by using INHIGEO networks. The activities of INHIGEO researchers from Japan are particularly noteworthy as they invited several colleagues from the USA and the UK to come to Japan. Others include the co-operations between China and Japan, the USA and France, and France and Austria, to name but a few out of the plethora of connections between our networks.

The vivid communication within the INHIGEO is rendered possible particularly thanks to the *INHIGEO Quarterly Circular* with four annual issues, published in March, June, September and December and presented by the secretary general. The Annual Report documents and compiles all INHIGEO activities thanks to William Brice as editor and can be accessed via our homepage.

In late 2019, the IUGS asked for a compilation of the most important activities and events of the INHIGEO from 2016 to 2019, which I then provided. I was myself slightly surprised to realise both how effective and productive the INHIGEO members had been during this period. Numerous workshops and symposiums were organised and many publications completed. Most of these meetings had an international focus, facilitating networking between scholars of different countries. From a global perspective, the members of INHIGEO have also paid greater attention to the Global South and established a Vice-Presidency for Africa on the next board and this position is to continue from 2020 on into the future.

Over the course of the last three years, the INHIGEO has deepened its existing contacts with the relevant academic journal *Earth Sciences History*, reflected not least in making its editor John Diemer a member of our new board as the person to succeed Bill Brice as INHIGEO Editor (2020-2024). The cooperation with the journal has proved particularly fruitful: as a result, the number of INHIGEO publications in *ESH* has considerably increased.

At the heart of the INHIGEO is its Annual Meeting. In 2019, it took place in Varese/Como. The year's meeting of 2020 had been planned to take place in New Delhi but was postponed to November due to the coronavirus outbreak! The next conferences in Prague and Krakow, planned for 2021, are already in preparation. The 2019 conference was particularly successful with eighty registered participants attending and 48 presentations given. Focusing on the topics "Communication" and "Mountains Environments" proved productive and worthwhile and was welcomed as topical by both local dignitaries and media representatives.

In 2019, we (Mike Johnston and Marianne Klemun) contributed an article to the journal *Episodes* as well as several "small pieces" to the IUGS bulletin and homepage (under the heading *Anniversaries*). Many INHIGEO members gave papers at conferences organised by the IUGS commissions (on stratigraphy, ethic geology).

At the moment, we are experiencing a slight backlog with our publications, excluding those organised by the Affiliated Associations. Several volumes of the journal *Earth Sciences History* are being prepared simultaneously (two on the conference in Mexico City), the publication on Armenia with Springer publishing house is in preparation, and the Varese conference volume will appear in an Italian publication series. *Earth Sciences History* will publish two volumes in 2020, 39/1 in April and 39/2 in October 2020.

John Diemer, the *ESH* editor, has scheduled a two-part thematic issue (39/2) based on the INHIGEO meeting in Mexico City in 2018. Part One of the thematic issue will be entitled "**Geological Agency in the Early Modern Period**" with guest editors Tina Asmussen and Pietro Daniel Omodeo (both are new members of the INHIGEO who attended the conference in Mexico). Part Two of the thematic issue will be a collection of papers with guest editors Luz Fernanda Azuela and Dante Moran-Zenteno. The collection of papers will be centred on the "**History of Geology in Mexico"**.

The proceedings of the Como/Varese meeting will be published in a volume edited by the Center for the History of the Mountain, Material Culture, and Earth Sciences of the University of Insubria (Italy): some papers will be submitted for publication in a thematic issue of *Physis. The International Journal of the Italian Society for the History of Science.* These publications are expected between 2020 and 2021.

The proceedings of the session "History of Stratigraphy in Italian Environments /17th-20th centuries)", sponsored by INHIGEO at the 3rd International Congress on Stratigraphy – STRATI 2019 – in Milan will be published in a special issue by *Earth Sciences History* in 2021.

For the *Thikomirov Award*, which was first granted in Brisbane by the IUGS and then in Cape Town in 2016, based on our ballot, INHIGEO has dedicated the award to **David Branagan** in Sidney. Congratulation to David!

The emergence of the coronavirus in late 2019 thwarted many of our plans. At the time I am writing this report we are still facing an unpredictable future. Had the coronavirus not interfered, the new board (2020-24) would have been confirmed by the IUGS in New Delhi in March and already taken up their work. We sincerely hope this will be the case in November 2020!

Given our current situation, I would like to wish everyone good health and a lot of optimism for the future. Many thanks for the lively cooperation between all our members!

Marianne Klemun, April 15th 2020.

EDITOR'S MESSAGE FOR THE 2019 *INHIGEO RECORD*

The first thing that I must do is to thank everyone who contributed material, information, articles, *etc.* for the 2019 *INHIGEO ANNUAL RECORD*, No. 52, and who, each year, help make our publication the success that it is. Please accept this expression of appreciation for your many contributions, and, please keep them coming in 2021 for the new editor, John Diemer. Each year, the success of the *Annual Record* is due to the many contributions submitted by our members.

And speaking of 2020, this is my last issue as your editor. It has been an honor and a privilege for me to serve in that capacity these past four years. As I said each with each issue, I have enjoyed working on the *Annual Record* each year and seeing how much fine and important work is being done around the world in the history of geology. Mike Johnston has done a great job reporting on the meetings, and reading his reports makes me even sadder that I have not been able to attend even one of them. I know I have missed so much. I was saddened to hear that Mike will not be doing the meeting reports in the future. He has done a fantastic job with these each year I have been editor and before I became editor. He leaves some very big shoes to fill.

So, I am stepping down after completing this issue and turning over the Editor's position to Dr. John Diemer, a faculty member in the Department of Geography and Earth Sciences at the University of North Carolina at Charlotte, Charlotte, North Carolina. If his name is familiar, that is because he is the current Editor of *Earth Sciences History*, the official journal of the History of Earth Sciences Society. That journal and John have developed a very close relationship with INHIGEO as outlined in the Secretary General's Report. With John editing both *ESH* and the *INHIGEO Annual Record*, I know this cooperation will grow and expand. Please join me in welcoming John to the position as INHIGEO Editor. I know I am leaving the *Record* in very capable hands.

Once again, I, too, offer my congratulations to those members whose work has been recognized with various awards and medals that are mentioned herein. And I extend my sympathies and condolences to the families, friends, and colleagues of those INHIGEO members who are no longer with us in body, but whose work and memories of friendships will long endure.

In closing, again, let me say what a great honor it has been for me to serve as your editor these past four years. It is time that I shall certainly treasure. My one regret is that I have not been able to meet, in person, each of you with whom I have corresponded via email. I know you will all continue to support the new editor as you have me and know, as does he, that I will be happy to work with John in any way I can to help in the transition.

I join my colleagues in welcoming our new INHIGEO members. The complete list, with their addresses, is to be found within this issue. I hope we all will take the time to send a welcoming note to each of them. And our congratulations to Prof. Dr. Lora Lordkipanidze of Uzbekistan on becoming an Honorary Senior Member.

As I write this message, the world is experiencing the worst pandemic since the great influenza outbreak during World War I. I truly hope that all of our members, their families, friends, and colleagues are able to stay safe and healthy. This, too, will pass, and I hope we will all emerge from these dark days stronger and wiser.

And finally, once again, thank you all for the privilege of being your editor for the past four years.

Cheers, Bill Brice April 22, 2020

PS: A photograph of my wife, Heather, and me as we go out on a Spring day in April 2020

INTERNATIONAL COMMISSION ON THE HISTORY OF GEOLOGICAL SCIENCES
44TH INHIGEO SYMPOSIUM

CONFERENCE REPORTS

The International Commission on the History of Geological Sciences (INHIGEO) 44th Meeting, Varese and Como, Italy 2 to 12 September 2019 with intra and post-meeting field trips.

Figure 1. Posters for the 44th Meeting. (Photographs are by the author unless otherwise indicated.)

In 2019 members of INHIGEO met in northern Italy, for the first time since the International Geological Congress IGC in Florence in 2004. The weather was fine except on the morning of one of the field trips and even then, a walk in a light rain through the forests and a heavy thunderstorm at the close of another field trip did not mar the outings.

Both the meeting (which was held at three separate venues) and the field trips were well run with good facilities for presentations and ample background material, particularly guidebooks for the trips. The organising committee comprised:

Ezio Vaccari (chair), Director of the Centre for the History of the Mountains, Material Culture and Earth Sciences (CHMCES), University of Insubria, Varese.
Libera P. Arena, CHMCES, University of Insubria, Varese.
Andrea Candela, CHMCES, University of Insubria, Varese.
Carlo Dossi, Department of Theoretical and Applied Sciences, University of Insubria, Varese.
Maria Faccioli, CHMCES, University of Insubria, Varese.
Francesca Gambino, Department of Earth Sciences, University of Turin.
Pietro Mosca, Institute of Geosciences and Earth Resources, National Research Council, Turin.
Alessandro Michetti, Department of Science and High Technology, University of Insubria, Como.
Marco Pantaloni, ISPRA, Department of Geological Survey of Italy, Rome.
Donatella Reggiori, Transnational Association Official Guides of Monte San Giorgio, Meride.
Silvio Renesto, Department of Theoretical and Applied Sciences, University of Insubria, Varese.
Luigina Vezzoli, Institute of Geosciences and Earth Resources, National Research Council, Pisa.

with collaboration from:
Fabiana Console, ISPRA Library, Rome and Italian Geological Society.
Franz Livio, Department of Science and High Technology, University of Insubria, Como.

Programme
Monday 2 September
The meeting commenced when in the early evening delegates from eighteen countries registered at the Palazzo Estense in Varese. This large ornate Baroque building was constructed for Francesco III d'Este and the House of Este. It was completed in 1760 and now functions as the Town Hall for Varese. Following an informal visit to the palace's extensive Estensi Gardens, modelled on those of the Viennese Schönbrunn Palace, those attending were welcomed in an ornate reception room in the palace (Salone Estense).

Figure 2. The Salone Estense, in the City Hall of Varese. (Courtesy of Ezio Vaccari).

After a brief introduction from Prof. Vaccari delegates were welcomed by a number of dignitaries beginning with Dr. Francesca Strazzi from the office of the Mayor of Varese. She was followed by two members of the local University of Insubria, Prof. Mauro Ferrari (Director of the Department of Theoretical and Applied Sciences) and Prof. Giorgio Zamperetti (pro-rector for International Affairs). Next was Prof. Antonio Orecchia of the Visconti di San Vito Foundation, which supports through scholarships students at the university as well as providing a venue on one of the meeting days. The concluding speakers at the welcoming ceremony were INHIGEO officials Prof. Barry Cooper (president), Marianne Klemun (Secretary-General) and Prof. Vaccari. Where relevant, translations were given by Kathleen Histon, a service she was to expertly provide throughout the meeting. Following the formalities, delegates were treated to a repertoire of Italian mountain songs by the renowned Val Tinella choir and then a buffet.

Figure 3. The Val Tinella Choir at the opening ceremony in the Palazzo Estense, Varese. Ezio Vaccari on the left and Kathleen Histon translating.

Tuesday 3 September

Papers, as summarised below, were presented in the *Aula Magna*, University of Insubria, Varese (for multiple authors, the speaker is underlined). Each scientific session concluded with a 15-minute discussion interval.

Figure 4. Participants at the 44th INHIGEO Meeting at the Aula Magna, University of Insubria. (Photo: Ivan Vtorov).

Scientific Session: History of the Earth Sciences in a Mountain Environment (1) – Chair: Ezio Vaccari

Gregory GOOD – *The Astronomers who Fell to Earth: Or, How the Copernican Revolution was Completed in the Alps*.
Gaston GODARD, Simone TUMIATI – *The ancient manganese mine of Praborna (Aosta Valley, Italian Alps): witness to the multi-centenarian evolution of mineralogy and glassmaking*.
Ernst HAMM – *Mountains and the Construction and Formation of the Earth: Leopold von Buch as Geologist and Naturalist*.
Sharad MASTER – *Geological exploration of the Ruwenzoris, the legendary Mountains of the Moo*n.

Scientific Session: History of the Earth Sciences in Mountain Environment (2) – Chair: Stephen Rowland
Mike JOHNSTON – *The "Dun Mountain* Inoceramus*" and the Maitai Controversy - a major stratigraphic problem in 19th century New Zealand*.
Paolo MACINI, Ezio MESINI – *Development of Geosciences and Petroleum Exploration in the Italian Apennines between 19th and Early 20th Century*.
Margret HAMILTON – *The geographer Ferdinand Löwl (1856-1908). His representation of the Tonalit of the Rieserferner group in 1893*.
Adele GARZARELLA, Wojciech NAREBSKI, R. DEERE, M. PATRICELLI, K. PIOTROWSKY, F. LARCINESE – *The impact of geology in the Italian Campaign: new contributions from Polish, Italian and British archives and documents for the study of the Mountain Warfare from the Gustav (Lazio-Abruzzo) to the Gothic Line (Toscana-Emilia Romagna)*.

Lunch was at the Villa Mirabello (Varese's main museum) which also allowed time to see an exhibition of some of the major works of the Italian painter Renato Guttuso (1911-1987). The guide for the Guttuso Exhibition was Lorenzo Giacandi and detailed explanations of the larger paintings were given by Daniele Cassinelli. All the guiding service was provided by the Association Archeologistics. Alternatively, the museum's extensive archaeological collections were visited.

General contribution on the History of Geology (1) – Chair: Luz Azuela
Francesca GAMBINO, Pietro MOSCA, Luca BARALE, Alessandro BORGHI, Anna D'ATRI, Luca MARTIRE – *A geo-historical tour through the city of Torino and the Susa Valley (NW Italy)*.
Ivan VTOROV – *The importance of A.E. Fersman research on Elba Island (1908)*.
Lucero MORELOS, *Dolores Rubio Ávila. A First Engineer´s Scholar and Academic in Mexico, 1910*.

General contribution on the History of Geology (2) – Chair: Ken Bork
Dorothy SACK **–** *Israel Cook Russell, Paradigmatic Pragmatist?*
Daniele MUSUMECI, Stefano BRANCA, Luigi INGALISO **–** *The Magmatological Tectonics: Alfred Rittmann's paradigm (1893-1980).*
Tina ASMUSSEN **–** *Rich Ores and Barren Rock: A Material History of Finding in the 16th and 17th centuries.*

Poster Session
Alessio ARGENTIERI, Giovanni DE CATERINI **–** *1969-2019: half century after the "Upper Liri Basin hydrogeology" study by Bruno Accordi and the new Roman geological school*.
Fabiana CONSOLE, Simone FABBI **–** *Bonaventura Montani: A forgotten pioneer of Italian Geological Mapping*.
John DIEMER – *The Geology of the Ural Mountains as Understood by Roderick Murchison in 1845*.
Maria FACCIOLI – *Mineralogical journeys in the 18th century as tools of knowledge of the Earth: the case of Marco Carburi*.
Algimantas GRIGELIS, Leonora Živilė GELUMBAUSKAITĖ – *The Prussian origin of Baltic amber: a history of discoveries*.
Loredana LANCINI – *Myths and legends as a source of reality: the place of geomythlogy in the history of geology*.
Lamberto LAURETI – *The geological School of Torquato Taramelli*.
Daniele MUSUMECI – *The Magmatological Tectonics: Alfred Rittmann's paradigm (1893-1980).*

Wednesday 4 September
History of Communication of the geological Sciences (1) – Chair: Martina Kölbl-Ebert
Fabio D'ANGELO **–** *From the Kingdom of Naples to Germany. The travel around Europe of six neapolitan Pro-rector naturalists (1789-1796*. Read by Ezio Vaccari.
Paolo SAMMURI **–** *Two letters on Mining sites in Tuscany by Giovanni Targioni Tozzetti to Count of Richecourt*.
Luz AZUELA **–** *Long distance collaboration: the Case of Joseph Burkart's Mexican Partners*.
Claudia SCHWEIZER **–** *Landscape and Economy: Ami Boué and his Suggestion of Efficient Routes and Railways in the "European Turkey".*

History of Communication in the Geological Sciences (2) – Chair: John Diemer
Marianne KLEMUN **–** *Communicating Geology between Bureaucracy, Public, Society and Laymen: the Geological Survey in the Habsburg Monarchy*.
Leonid KOLBANTSEV **–** *History of the Geological Mapping in Russia: from the first sketches to the State Geological Map*.
Barry COOPER **–** *Geological maps from South Australia: their fundamental historic role in communicating geological information*.
Marco PANTALONI **–** *The 1:1M Geological Map of Italy: a milestone in geological knowledge*.

Lunch was again at the Villa Mirabello with the opportunity to visit the Guttuso Exhibition or the Archaeological Museum at Villa Mirabello.

Scientific Session: History of Communication in the Geological Sciences (3) – Chair: Silvia Figueirôa.
Johannes MATTES **–** *Communicating between Research and the Public: The Role of Earth Sciences & (Popular) Scientific Societies for the Distribution of Knowledge in Nineteenth-Century Vienna*.
Michiko YAJIMA **–** *The first report of fossils from Japan based on showpieces of the world exposition*.
Zoya BESSUDNOVA, Galina LYUBINA **–** *Paleontologist Maria Pavlowa's communication with foreign scientists in the late 19th - early 20th century*.
Andrew HOPKINS **–** *The Collapse of an Argument: Alfred Wegener's Use of Geodetic Data*.

Scientific Session: History of Communication in the Geological Sciences (4) – Chair: Mike Johnston
Toshihiro YAMADA **–** *Geoscientists and the Buddhism Terms: the Popularization of Science and 'Cosmic Consciousness' in 1920s Japan*.
Martina KÖLBL-EBERT **–** *Limits of Communication: Letters by German Geologists in context of the Nazi regime*.
Stephen ROWLAND **–** *Fritz Zerritsch's Mid-Twentieth-Century History-of-Life Wall- Chart Roll-Ups and his Collaboration with Paleontologist Erich Thenius*.

INHIGEO Business Meeting at Villa Toeplitz (Sala Seminari) – see separate report

Following the meeting it was a short walk to the Villa Toeplitz Garden and a convivial cocktail in the grounds of the Villa Toeplitz Tennis Bar.

Thursday, 5th September – Mid-Meeting Field Trip

The mid-meeting one-day field trip followed in the footsteps of participants of the 7th Extraordinary Meeting of the Italian Society of Natural Sciences held at the Palazzo Estense in Varese in September 1878. Both trips examined geological points of interest in Monte San Giorgio and Valceresio in the Prealps north of Varese. Our trip leaders were Donatella Reggiori, Maria Faccioli, Andrea Candela and Ezio Vaccari. Participants were also provided with a very detailed, attractively produced tour guide for this and subsequent trips that clearly portrayed the geology, culture and history of this very attractive region. Contributors to the guide book were Donatella Reggiori, Libera P. Arena, Luca Barale, Simone Bonomi, Alessandro Borghi, Andrea Candela, Maria Faccioli, Pietro Mosca, Silvio Renesto and Ezio Vaccari. Kathleen Histon again did an outstanding job on this and other trips in giving excellent translations into English where appropriate.

The first stop for the mid-meeting trip was at *La Predèra* in Brenno Useria where the Jurassic Pietra Bianca sandstone was extracted from underground galleries for 95 years until 1945. The stone was widely used for buildings, headstones and memorials (including one to those from Brenno who died in the second world war and fittingly built over the site of the excavations). The stone was exported to as far away as the United States. Despite the extensive excavations under the town, there has been no problem with ground settlement.

Figure 5. At La Predèra in Brenno Useria, the site of an underground mine in the Jurassic Pietra Bianca sandstone. Ezio Vaccari (centre) and Donatella Reggiori (right).

The second stop was at Viggiù (close to Swiss border) at the abandoned quarry *Cava Danzi*, one of a number in an arenaceous limestone of basal Jurassic age. The limestone has been quarried in the Viggiù area since well before the 16th century, principally for use as a building stone. After having been introduced to the owner of one quarry, dating from the late 19th century, and a local historian (Messrs Augusto Danzi and Beppe Galli respectively) we entered the impressive chamber left as a result of quarrying of the limestone that dips at about 35º into the wooded hillside. Massive limestone and in places brick pillars support the roof. With the aid of headlamps and torches we were able to see how the massive slabs for buildings were cut and extracted. Prior to the internal combustion engine, the stone was cut using chisels; explosives were never utilised because of the risk of fracturing the rock and the additional expense. With oil engines the helical wire technique was introduced but quarrying still remained labour intensive. It was primarily the high cost of extracting the stone that led to the demise of quarrying in the area. Higher in the hills our third stop was to another underground quarry (*Cava Cassani*) which is now partly flooded, its dark water giving it the appearance as a scene from middle earth.

Figure 6. Jurassic arenaceous limestone at the entrance of the Danzi Quarry. (Photo: Ivan Vtorov).

Lunch was the rooms of the *Società Operaia di Mutuo Soccorso* (S.O.M.S.) originally a mutual aid society founded in 1862, many of whose members had been stone masons (there were at the time around 2,000 men working in the quarries). The decline in the numbers of stone mason began about the start of the 20th century when cement could be manufactured into moulds that easily and quickly replicated the intricate designs of the carvers. Examples of such artificial facades were even to be seen on the buildings adjacent to where we had lunch. At the S.O.M.S. we were given a precis of its history by President Dario Sanarico and also its future goals as a local fellowship and school of arts and handcrafts. Also greeting us was Emanuela Quintiglio mayor of Viggiù. It was a noticeable feature of all of our stops in the towns was the welcomes we received from local civic leaders. The society's *picasàss* or stone-cutters museum records the skill of many generations of miners and stonemasons.

In the afternoon we visited one of a number of small abandoned Besano bituminous shale quarries, passing on the way conspicuous quarries of red porphyry, which we were to examine in detail three days later. From Besano we had a relatively long walk up a track that is part of the Geo-Paleontological Path of the UNESCO World Heritage site of Monte San Giorgio. The track climbed on a moderate gradient through forest with glimpses of Besano below and then in the distance Lake Lugano. The Besano Formation, of Mid to Late Triassic age, dips gently into the mountainside and unconformably rests on Permian rocks. The bituminous shale within the formation has been quarried since earliest times for distilling into oil. It is also of great scientific interest for its fossil remains. With the sky darkening it was a quick downhill return to the valley floor and as the last participant climbed on to our bus a thunderstorm broke. The last stop of the day was the Besano Museum of Fossils where, after a welcome by the town's mayor (Leslie Mulas) and museum staff of the Association Archeologistics, we were able to see many fine exhibits related to the mining of the shale and a number of superb Mid Triassic reptilian remains, including ichthyosaurs, collected from the Besano Formation at Rio Ponticelli. After a very informative day it was a very satisfied group who returned to Varese.

Friday 6 September

After the field trip it was a change in venues for the final two days of papers. On the Friday we were bussed from Varese to Como and assembled in the Aula Magna of the University of Insubria. The Como campus of the university occupies much of the cloistered multistoried Basilica of Saint'Abbondio, an outstanding example of Italian Romanesque. Like many such structures it has a long history of rebuilding, but the main elements of the existing structure were begun in the 16th century.

Visual Language in the Geological Sciences – Chair: Marianne Klemun

Renee CLARY – *Illustration within Informal Geological Communication during the Golden Age of Geology (1788-1840)*.

Alberto VIANELLI – *The illustrations (1802-1809) of Grignon (Paris Basin Eocene) fossils commissioned by Lamarck: a tool to understand how he coped with a rapidly changing science of nature*.

Maddalena NAPOLITANI – *Réunir à une belle exécution artistique une grande véracité géologique »: the painted decoration of the École des Mines of Paris during the 1850s*.

Simon NATHAN – *The photography of Alexander McKay and Lloyd Homer: recording the geology and landscapes of mountainous New Zealand*.

Figure 7. Simon Nathan presenting his paper on New Zealand geological photographers Alexander McKay and Lloyd Homer at the Como campus of the University of Insubria.

General contributions on the History of Geology (3) – Chair: Mauro Guglielmin

Pietro Daniel OMODEO – *Geoenvironmental Management in Renaissance Venice: When A Galilean Mathematician Tried to Solve the Hydrogeological Problems of the Lagoon*.

Eugenija RUDNICKAITĖ – *The most prominent scientists who spread the geological knowledge at the very beginning of the history of Vilnius University*.

Barbara MOHR – *Teaching geosciences from the 19th century on in central Europe and its influence on society*.

Maria Margaret LOPES – *Paleontology for Oil. The Brazilian Geological and Mineralogical Survey's works, in the first decades of 20th century*.

Peter SCHIMKAT – *Commemorating "Vulkanismusstreit und Geochemie" (1991) - A Forgotten Modern Classic Revisited*.

After lunch in the cloisters we were introduced to Luigina Vezzoli and Franz Livio our guides on a historical-scientific walking tour of central Como. The city was founded by Julius Caesar in 59 BC and its famous sons include the two Plinys and Alessandro Volta. Many different rock types have been utilised in the building of Como and reflects the varied geology of the nappes of the Pre Alps. Many of these rocks crop out along the shores of Lake Como and were thus relatively easy to procure. After examining the granodiorite columns of the cloisters and the marble floor we moved to the outside of basilica where the use of different building stones is readily apparent. This includes marble, limestone and sandstone with Chiavenna Soapstone (a talc-chlorite schist) for intricate stonework. After negotiating the busy highway down slope of the basilica we reached the great limestone walls enclosing the old city of Como. These massive limestone walls were built under the direction of Frederick I (Barbarossa) in the 12th century on the remains of the walls dating back to Roman times. The third stop was in Via Volta at the site of a house occupied by Alessandro Volta. Nearby a plaque records the depth that the street was flooded to when Lake Como overflowed in 1673. As we were to learn flooding is not the only hazard parts of Como face. The next place of interest was the Porta Torre, a 40-meter tower built in the late 12th century to guard the main entrance to Como.

Figure 8. Participants about to walk through historic Como being briefed by Franz Livio in the university grounds at Como.

Our fifth and sixth stops respectively were the San Fedele Basilica and Santa Maria Assunta Cathedral (*Duomo*). The Romanesque basilica was built in the 12th century whereas the cathedral was completed in 1770. Both buildings made use of Musso Marble, in case of the cathedral exclusively so. Competing with the cathedral is the Broletto. This 13th century

building was formerly the municipal hall. The cathedral also records historical flooding of the town. Walking towards the lake edge even lower-lying ground was crossed, being former marsh. This, for good geotechnical reasons if for no other, was left undeveloped until the 19th century. The buildings subsequently erected show ample evidence of subsidence. The second to last stop of the day was to the Museo Casartelli within the Carducci Institute that was founded in 1910. The museum, established in 1917, was a teaching aid to graphically demonstrate sciences in schools. The main exhibition room, crammed with science related objects, is named Nobel's Hall; the outcome of a physics meeting held in 1927 and at which 12 of the 45 physicists attending were Nobel Prize recipients. From the museum it was a short walk to the shore of Lake Como and the Tempio Voltiano. This neo classical styled building was completed in 1927 to house memorabilia such as machines, instruments and documents related to Volta. The Tempio Voltiano completed a thoroughly absorbing walk through time and which also showcased the geology of Lake Como and its environs. The return journey was broken by a light meal at a roadside restaurant and we arrived in Varese late in the evening.

Figure 9. Admiring the scientific exhibits in Nobel's Hall in the Carducci Institute, Como.

Saturday 7 September

It was a fine cool morning with Monte Rosa, Italy's second highest mountain at 4478 m, glistening under a fresh coating of snow that we left Varese for Somma Lombardo and the final day of papers. Our bus journey took us southwest of Varese to only a few kilometres north of Malpensa, Milan's principal airport. On arrival at the Castello di San Vito, a 13th century fortress, we were ushered into the ornate Salone d'Onore. With a little time to spare, we were given a preview of one of the many treasures that the castle contains and that was an adjacent large room whose walls displayed a huge collection of shaving bowls. It was then time for a formal welcome by Gaetano Galeone (President of the Visconti di San Vito Foundation) and Raffaella Norcini (representative of the town council of Somma Lombardo) as a prelude to the first session of the day.

Session honouring Nicoletta Morello – Chair: Ezio Vaccari

Ezio VACCARI – *Nicoletta Morello and the history of geology in Italy*.
Claudine COHEN – *Early modern Earth theories and scenarios of Human origins*.
Luca CIANCIO – *"In centro terrae est Sol centralis". The debate between Naudé, Peiresc and Gassendi around volcanic fires (1631-1649).*
Silvia FIGUEIRÔA – *Nerée Boubée (1806 - 1862), an activist for communication in the geological sciences*.
Claudia PRINCIPE – *The contribution of the "Riunioni degli Scienziati Italiani" (Congresses of Italian Scientist) to the circulation of the Geological Ideas, and as part of the process of unification of Italy.*

Figure 10. Ezio Vaccari opening the session honouring Nicoletta Morello in Castello di San Vito.

Scientific Session: History of the Earth Sciences in Mountain Environment (3) – Chair: Barry Cooper

Norman HENNIGES – *Glacier Men: Albrecht Penck, Eduard Brückner and the experience of Quaternary fieldwork in the Alps and the Alpine Foreland, c. 1900.*

Maria CONFORTI – *The volcano and the sea: discussions on the role of waters in eruptions in Italy in the 17th century.*

Andrea CANDELA – *Visualising the theory of the Alps: the first geological map of the Western Lombard Prealps by Christian Leopold von Buch (1829).*

INHIGEO 2019 Best Poster Award to a young scholar

The posters were judged by a panel consisting of the INHIGEO President and Secretary-General and the recipients were introduced by Ezio Vaccari. The three joint winners were: Maria Faccioli (Mineralogical journeys in the 18th century as tools of knowledge of the Earth: the case of Marco Carburi), Daniele Musumeci (The Magmatological Tectonics: Alfred Rittmann's paradigm (1893-1980)), and Loredana Lancini (Myths and legends as a source of reality: the place of geomythlogy in the history of geology). To warm applause, the recipients received copies of the 1987 INHIGEO Meeting proceedings volume (*Rocks, Fossils and History*, edited by Gaetano Giglia, Carlo Maccagni and Nicoletta Morello, Florence, 1995). At the conclusion of the awards INHIGEO president Barry Cooper highlighted the success of the meeting, commenting on the wide range of papers and the venues where they were presented. He profusely thanked the organisers of the meeting and in doing so paid special tribute to Ezio Vaccari and Kathleen Histon. Then followed lunch and a tour of the Visconti di San Vito Castle, which amongst its many household treasures are numerous objects, including in its upper rooms elaborate chandeliers of Venetian glass to more lowly items in its kitchens as well as a room with artefacts from the nearby late Bronze age archeological site of the Golasecca culture.

Close to the castle in the partly forested land owned by Casorate Riding School (and beneath the flight path to Malpensa Airport) is a geodetic station marked by an approximately 2-meter high pyramid of Baveno granite of Permian age. Like an iceberg, there is more of the pyramid hidden below the surface that above. Being the weekend, the riding school grounds were in use and the club's President, Paolo Reinach, provided us with background on its activities. This was followed by a detailed explanation as to the significance of the monument, which was built in 1833 and marks one end of 10 kilometer (9999.5380 to be precise) base line that constitutes one of eight critical base lines that were used in the triangulation of what is now modern day Italy. Being the northern most such base line in Italy, it played a key role in connecting across the Alps the Italian survey to similar triangulations in Switzerland and France. From the plains of the riding school it was a drive back to the limestone hills at the Grotte di Valganna of Varese. Here in the evening INHIGEO members were able to partake in three activities. Donatella Reggiori together with the guides of the Campo di Fiori regional park led a walk first through the steep forested geotrail to examine the karst terrain and then the travertine deposits forming the waterfall. The staff of ASPEM-AGAM (the water management company of Varese area) led by Davide Bellomi, allowed access to the local waterworks in order to go underground by way of an abandoned railway tunnel that is now used to tap water for the nearby residential area. Representatives of the local town council of Induno Olona (Emanuele Marin and Monica Filpa) also welcomed the group and accompanied the members in the activities. After working up a good appetite, members congregated in the Ristorante Le Grotte di Valganna adjacent to the waterfall for the conference dinner.

Figure 11. Pyramid of Baveno granite marking the geodetic station on the forested plain north of Somma Lombardo.

During the four days of scientific activities participants in the parallel accompanying persons cultural program enjoyed guided visits (mainly managed by the association Archeologistics) to two UNESCO sites (Sacro Monte, Varese; Castle Seprio Archeological Park, Somma Lombardo), the Italian heritage buildings (FAI) Torba Monastery and Villa della Porta Bozzolo, the area of Lake Maggiore

including the Santa Caterina Hermitage and the medieval castle Rocca d'Angera, the lakeside historical villas and the Brunate cable-railway of Lake Como as well as many examples of the architectural Liberty style in the city of Varese.

Figure 12. Accompanying persons group at Ranco Harbour, Lake Maggiore, taken by Anna Good with Kathleen Histon's camera.

Post-meeting Field Trip

This well attended, five-day trip was split between Varese and Turin and included a wide variety of geological, historical and cultural sites.

Sunday, 8th September

Rain overnight was easing as we again clambered into our busses and headed into the hills north of Varese (and which we had driven past on the field trip on 5 September) to Cuasso al Monte in Valceresio. Disembarking near the top of the hill, and, fortified by a shot of Amaro Alpino (a liquor made from juniper and many other herbs), we headed into the forest. Sheltered from the wind and with the rain easing, it was a pleasant walk and by the time we emerged at uppermost of several quarries in red granophyre of Permian age, the sun was breaking through the clouds lingering over the mountains. At the quarry we were met by its owner Simone Bonomi who explained its working and gave an informative talk on the "rose porphyry". Descending the hill to his restored mountain farmhouse (Cascina Forcorini) our host and his family plied us with coffee and croissants while we viewed a wide variety of samples that had been collected from the quarries over a number of years, many displaying classic porphyritic texture along with vugs filled with quartz crystals. Skirting an even larger quarry we were then shown over the Bonomi state of the art processing plant that cut and polished slabs for buildings, manufactured cobble stones and a range of aggregate. The last stop on the quarry land was to the ruins of Cuasso al Monte Castle from the Longobardo Period. The castle, of local granophyre, is strategically on a small knoll close to the valley floor adjacent to the road leading from Milan to the Alpine passes. The castle's origin is obscure, but it was built in many stages starting about 7th century on a site that was chosen by the Romans. Its design was sufficiently successful as to be copied in other places, including Warkworth Castle in northern England, leading to speculation that the design originated with the Saxons. The members then proceeded for lunch at the Ristorante Alpino in the village of Cuasso al Monte.

Figure 13. Heading into the forest on the first day of the post-meeting fieldtrip to Cuasso al Monte in Valceresio.

Figure 14. Cuasso al Monte Castle near Lake Lugano built of red granophyre of Permian age. One of the working quarries visited earlier in the day is in the background.

In the afternoon there was a climb along a road through forest to the Besano Ca'del Frate fossil locality on Monte San Giorgio, south of Lake Lugano. The palaeontologist Silvio Renesto, from the University of Insubria, was our guide to this locality, which is one of the most important fossil sites in Italy, as was confirmed by our being accompanied by members of the local parks service to one of the principal excavations in Middle Triassic limestone. From a zone about 1 to 2 metres thick in the moderately gently dipping, well bedded limestone a wide variety of fossils have been collected since the mid-19th century. However, due to mixing and mislabelling of collections considerable confusion prevailed as to the relationship of the Ca'del Frate fossils to others from nearby different stratigraphic horizons in the Middle Triassic rocks. While there was no sign of any fossils, we were able to view specimens at the Monte San Giorgio Visitor Centre in Clivio. We were first of all welcomed by Debora Lonardi of the local town council and were then guided through the centre by Emanuele Zenga and Silvio Renesto with its collection of small reptiles such as *Lariosaurus* (that was probably equally at home on land and in the water), fish, fern and other fossils.

Monday 9 September

In contrast to the rather humid conditions the previous day, the trip began in cool weather under a clear sky with Monte Rosa visible in the north as we headed to the Mining Park of the Valsassina Valley in the scenic mountains east of Lake Como. Being one of the most important mining areas in Lombardy (Lecco Province) due to the presence of iron, lead, silver, copper and other minerals that were mined for centuries, the park is of great historical significance. The first stop was to the Cortabbio di Primaluna Mining Park centred on a barite mine that closed in 2012. The workings are accessible, and we were guided underground by Andrea Benaguo and Andrea Pozzi through what had been the main level for drainage and ore haulage. This follows the main, more or less vertical, barite vein within dolomitic-rich sedimentary rocks of Late Triassic age. After about 500 metres the level opens out into a large chamber or gallery which supplied most of the ore extracted in the last 30 years of mining. By means of a series of vertical ladders we were able to ascend higher into the chamber where a full appreciation of the size of the barite vein was obtained. On exiting the mine Dario Milani, the director of the park, interpreted drill core samples for us thereby conveying some idea of the complexity of the deformation the rocks had undergone. From the mine many participants availed themselves of an enclosed tubular slide that now provides a short cut to the buses in the parking area below the mine.

Figure 15. About to go underground at the barite mine, Cortabbio di Primaluna Mining Park, near Lake Como.

Figure 16. Exiting the barite mine - in style.

A narrow winding road through forest clinging precariously to the steep mountain sides delivered us to Rifugio Sel restaurant on a saddle on the old hiking and skiing route over the mountain range. After lunch it was a short walk down the mountainside to the Piani Resinelli Mining Park at about 1300 m above sea level. Like other mines in the vicinity Piani Resinelli has a long history of exploitation. The mine primarily produced argentiferous galena (lead sulphide carrying silver) within the limestone. Until the late 19th century, mining was dominantly undertaken in winter as water that could prove a hindrance to the miners was frozen. During the summer the miners worked in the fields or in other agricultural related pursuits. In the late 19th century the mines became progressively more mechanised, and we were able to see this transition in the Anna Mine that closed in 1958. Underground there are a number of levels that twist and turn as the miners followed the ore with galleries and chambers where the veins thickened.

Figure 17. Explaining the history of the Anna Mine in the Piani Resinelli Mining Park.

Tuesday 10 September

Today heralded a change in that our buses headed for Turin where we were to spend two nights. However, on the way we examined another mine at Ornavasso. Unlike the carbonate mines and quarries that we had so far seen,

this one was exploiting a tectonised vertical band of Cambrian marble. Following our guide, Stefano Zucchi, we went first to the place where the upper part of the mine starts in an ancient quarry before following the marble underground. The lower mine a short distance downslope is accessed by a reconstructed mine tramway. The ore waggons, now used for passengers, are well roofed and the need for this was soon demonstrated as on entering the mine torrents of water fell from the roof. At the end of the mine a chamber ("Cava Grande") gives a 3D perspective of the marble (and also én echelon mafic dikes cutting it) and the way it was extracted in the form of large building blocks using diamond wire and then large chainsaws. The exposure would keep a structural geologist occupied for weeks. The mine also gave an insight into how groundwater dissolves carbonate rock as it intersected a number of natural passages. The mine closed in 2008 because of little demand for the rock and the high cost of extraction. After a pleasant lunch at Antica Trattoria del Boden at the head of another narrow winding road overlooking Ornavasso, we continued on to Turin.

Figure 18. Michiko Yajima pondering on the structural complexity of Cambrian marble in the Cava Grande, Ornavasso.

In Turin we disembarked in light drizzle near the railway station and were greeted by Francesca Gambino, Alessandro Borghi, Pietro Mosca, and Luca Barale who took us on a highly informative tour of the centre of Turin with an emphasis on its magnificent buildings that have utilised a wide variety of building stone. The principle stops were the Piazza C. L. N (Comitato di Liberazione Nazionale), Piazza San Carlo, San Federico Gallery, Palazzo Madama, Mole Antonelliana (its 167.5 m high dome being perhaps Turin's most distinctive building) and the University Palace. Arguably the most interesting building is the Palazzo Madama, whose present form dates from the 15th century and now houses the city's collection of ancient art. The palace's elegant façade is faced with nine different building stones some of them replacing rock that had deteriorated over the decades and the gallery is currently closed for more extensive repairs. Fully understanding petro-architectonic history of building stones is an essential requisite in their restoration and maintenance of such ancient buildings. The Chianocco Marble widely used in baroque buildings in Turin, including the palace, is an instructive example. This rock (deposited as a limestone) was metamorphosed to marble but was then deformed and fractured to become a cataclastite. The fractures were recemented by secondary carbonate, but the rock has subsequently been prone to dissolution, a process hastened on exposure to the contaminated air of a metropolis. The tour concluded at the traditional Turin Fiorio Café where we tasted examples of the local cuisine. In the evening participants were housed at the Victoria Hotel, the first time during the meeting as far as accommodation was concerned that all were under one roof.

Figure 19. Exploring the architectural delights of Turin – the Piazza San Carlo and the San Carlo and Santa Cristina churches.

Figure 20. Luca Barale, Alessandro Borghi, and Francesca Gambino explaining the various changes that have occurred to the Chianocco Marble used in the construction of the Palazzo Madama and other historic buildings in Turin.

Wednesday 11 September

Blue sky was a good omen for a day's field trip to the Susa valley through which flows the Dora Riparia tributary of the Po River. This beautiful, glaciated valley is often known as the key to Italy as it connects the Piedmont region with France. The first stop was at the small Foresto dolomitic marble quarry. Although this marble was used as a building stone, it and the adjacent hillside showed more clearly the complex geology of the Alps with thrust faults within and separating various rock types including ophiolitic slices. This was elucidated on by our guides Francesca Gambino, Pietro Mosca, and Luca Barale. Close by, and forming the focus of our next stop, was the Susa Arch. However, reaching it directly through the narrow streets of the attractive town of Susa was an insurmountable obstacle for the bus, so we continued on foot for the last 300m. Built in 9-8 BC of white marble the arch is one of the oldest in Italy and was part of a larger complex within an important city on the ancient road to Gaul. The midday stop was for a traditional pizza at the family-run Pizzeria Gianka in the town of Oulx at 1100 meters above sea level in the upper Susa valley. More altitude was gained after lunch when we took a mountain road to climb above the town to get an overview of the valley and its enclosing mountains. The final stop, fittingly, was to a serpentinite quarry within an ophiolitic slice containing a brecciated mixture of serpentinite and carbonate (ophiocarbonate) at Cesana Torinese about 10 km south of Oulx. Despite its geological history, the rock is sufficiently hard to carve (as we saw in Turin) into an intricate building stone. After Ezio thanked our three guides for their excellent commentary during the day, it was a return to Turin.

Figure 21. Debating the meaning of lineations in the Foresto Marble, Susa valley.

Figure 22. Examining ophicarbonate in an abandoned building stone quarry in Cesana Torinese. Inset – this is the same rock used in the San Federico Gallery, which we saw in Turin.

Thursday 12 September

After the high Alps of the day before, it was for the final segment of the trip (and the INHIGEO meeting) - a museum day. In the morning was the Museo Egizio (Egyptian Museum), which has the largest collection of artefacts from ancient Egypt outside of that country. Our tour was specially arranged and lead by a group of guides under the supervision of Denise Valentino, focusing on the variety of rock types and their origin used in the Egyptian artefacts ranging in size from very small to large. By the clever use of mirrors and lighting in some of the galleries the larger objects are made even more impressive. The museum also has on display a large, but fragmentary, papyrus dating to the reign of Ramesses IV (1156-1149 BC) and which is one of the oldest geological maps known.

Following lunch, the next museum was that of the Museo Nazionale della Montagna (National Museum of the Mountain) which stands on Monte del Cappuccini. From its position the museum has a commanding view over the Po River to Turin (dominated by the Mole Antonelliana) with the snow-covered Alps forming an impressive backstop. The museum as the name suggests specialises in the mountains and the activities that take place in them. Displays show mountain cultures and communities, maps and mapping, the evolution of skis, alpine techniques, a section on mountain cinema and the like. From the museum we retired to the Museum's café in a nearby courtyard for a farewell drink and thanks to our hosts before returning to Varese, thereby bringing to a close the 44th INHIGEO meeting.

In concluding this report of an exceptionally well organised and run meeting and field trips, due thanks go to the organising committee, the trip leaders and those who compiled the lavishly and comprehensive field trip guidebook. An example of the generous hospitality we received was that at every small museum we visited, a representative of the local council was there to welcome us. There was an excellent translator so problems or misunderstandings that might have arisen from language difficulties were avoided. It was a great experience to have visited Varese and Turin (and numerous other places surrounding them). In common with many INHIGEO meetings of recent years, it was a memorable experience, and the thanks of all participants goes to the many individuals mentioned above who ensured the meeting's success. I would finally thank Ezio Vaccari and Kathleen Histon for their comprehensive review this report and to Ivan Vtorov and Anna Good for photographs (more of Ivan's outstanding photographs can be viewed at:
https://commons.wikimedia.org/wiki/Category:44_INHIGEO_-_Italy,_2019).

Mike Johnston, Nelson, New Zealand

Reporter's Postscript

In 2003, after attending in Ireland my first INHIGEO meeting, David Oldroyd (then Secretary-General) asked if I would prepare a report for what was then called the commission's Newsletter. This I agreed to do and on thinking about it (and consulting some of the reports of earlier meetings), I concluded that as so much effort goes into holding meetings (on the part of both the organisers and participants) it was worth compiling a detailed report. We are after all historians and we have a responsibility for documenting our own activities as well as the history of geology. Somehow or other I continued to compile reports of subsequent meetings. While this involves some effort on my part, it also personally results in a greater understanding and appreciation of what was seen and heard during the meetings. I decided late last year not to attend the INHIGEO meeting that was planned to be held in conjunction with IGC in New Delhi. This decision was principally because I do not enjoy large gatherings, although the range of fieldtrips usually more than adequately compensate for this. There is also the cost of growing travel difficulties in attending meetings. For the majority of meetings, this for me has involved considerable time in the air (about the only disadvantage of living in New Zealand), including 11 trips around the world and two more equivalent to this. With increasing age these difficulties seem to multiply and, expenses, such as travel insurance, are starting to become prohibitive. This coupled with other commitments, including completing a Nelson goldfields history, means that I will likely only attend meetings sporadically in the future. Consequently, this will be my last meeting account and indeed it is probably good for INHIGEO that, after 17 reports, a fresh perspective is introduced on our activities.

Mike Johnston

Editor's Note: On behalf of myself, and the previous editors since 2003, I want to extend a very big THANK YOU to Mike for the service he has performed over the years in preparing these extensive meeting reports. They are always detailed, well prepared, and make for enjoyable reading, especially for those, like me, who were not able to attend the meeting being described. His work will certainly be missed, and he leaves a very large vacuum to be filled by the next editor. Good luck, John, finding someone as capable and as faithful as Mike has been. And good luck, Mike, with your future research and work, and I hope we can, from time to time, see the product of this work in subsequent issues of the *INHIGEO Record*. **Bill Brice**

FUTURE INHIGEO MEETINGS

2020 MEETING NOTE: Due to the world-wide pandemic due to the COVID-19 outbreak, the INHIGEO meeting scheduled for New Delhi in March 2020 has been postponed until a future time.

POLISH GEOLOGICAL INSTITUTE – NATIONAL RESEARCH INSTITUTE
INTERNATIONAL COMMISSION ON THE HISTORY OF GEOLOGICAL SCIENCES
GEOLOGICAL SOCIETY OF POLAND
POLISH ACADEMY OF ARTS AND SCIENCE

46TH INTERNATIONAL COMMISSION ON THE HISTORY OF GEOLOGICAL SCIENCES (INHIGEO) SYMPOSIUM CRACOW, POLAND, 18-24 JULY 2021

The INHIGEO 2021 conference will be held at the Polish Academy of Arts and Science, Cracow.

We sincerely invite you to POLAND to attend the 2021 INHIGEO Symposium.

In this first Circular, we announce the symposium and provide information about conference themes and associated excursions. We ask you to complete the "Expression of Interest" form – please see Appendix G. and the INHIGEO website for the form. Please return this form at your earliest convenience, but preferably by November 30, 2020, to inhigeo@pgi.gov.pl.

CONFERENCE THEMES

1. History of geological surveys and biographies of their creators; 2. History of geological societies; 3. History and development of geological cartography; 4. Mining history; 5. General contributions and biographies of famous geologists.

SCIENTIFIC COMMITTEE

Prof. Stanisław Wołkowicz, Chairman of the Committee, Polish Geological Institute - National Research Institute, Warsaw;
Prof. Barry J. Cooper, President of INHIGEO 2016-2020; University of South Australia, Adelaide;
Prof. John Diemer, Editor of the INHIGEO Annual Record 2020-2024, University of North Carolina, Charlotte;
Prof. Adam Gasiński, President of the Polish Geological Society, Jagiellonian University, Cracow;
Prof. Marianne Klemun, Secretary General of INHIGEO 2016-2020; University of Vienna, Vienna;
Prof. Michał Kokowski, Chairmen of Science History Commission of Polish Academy of Arts and Science, Cracow;
Dr. Martina Kölbl-Ebert, Secretary General of INHIGEO 2020-2024, University Munich;
Prof. Piotr Krzywiec, Institute of Geological Sciences of the Polish Academy of Sciences, Warsaw;
PhD. Barbara Olejarz, Director of Oil Mining Museum in Bóbrka;
Prof. Janusz Skoczylas, Adam Mickiewicz University, Poznań;
Dr. Slavko Solar, Secretary General of EuroGeoSurveys, Brussels;
Prof. Radosław Tarkowski, Mineral and Energy Economy Research Institute of the Polish Academy of Sciences, Cracow;
Prof. Ezio Vacari, President of INHIGEO, 2020-2024, Università degli Studi dell'Insubria, Varese;
Dr. Zdeněk Venera, President of EuroGeoSurveys, Director of Czech Geological Survey, Praque;
Dr. Krystyna Wołkowicz, Secretary of the Committee, Polish Geological Institute- National Research Institute, Warsaw;
Prof. Andrzej J. Wójcik, Institute of the History of Sciences of the Polish Academy of Sciences, Warsaw.

LOCAL ORGANIZING COMMITTEE

Prof. Stanislaw Wołkowicz,
M.Sc. Céline ANDRIEN - Director of the EuroGeoSurveys Secretariat
M.Sc. Anna Bagińska
M.Sc. Monika Cyrklewicz
M.Sc. Ewa Dąbrowska-Jędrusik
M.Sc. Anna Romanowska
Dr Krystyna Wołkowicz,

Conference venue will be at the headquarter of Polish Academy of Arts and Sciences

REGISTRATION FEES: 400 euros for Conference and Mid-Meeting Trip (Bóbrka) (early bird registration).
Fee will include: coffee breaks and lunch during the Conference, transportation and lunch during Mid-Meeting trip, as well as the Conference dinner at the one of the famous Cracow restaurant.

14-18 July 2021 – Pre-Meeting trip 400 euros for Pre-Meeting Trip (early bird registration). Fee will include: transportation, hotel, breakfast, lunch and dinner.

250 euros for special program for accompanying participants (early bird registration). Fee will include: Special tours during the Conference, Mid-Meeting Trip and the conference dinner at the famous Cracow restaurant.

NOTE: Registration fees will not include hotels costs during the Conference.

IMPORTANT DATES:

- 30 November 2020 - Deadline for Expression of Interest for symposium and preconference trips.
- 1 March 2021, deadline for abstract and full articles submission.
- 31 March 2021, notification of acceptance and 2nd Circular.
- 15 June 2021, closure of early bird registration for symposium, pre-conference trip, accompanying participant's early bird on-line registration fee payment.
- Registration fees for symposium and pre-conference trips after 15 June will be 450 euros, and 300 euros for accompanying participants.

Visa Information Citizens of the Schengen area, Australia, USA, Canada and many others – visa-free regime. More information about visa policy of Poland: : https://udsc.gov.pl/en/cudzoziemcy/obywatelepanstw-trzecich/chce-przyjechac-do-polski/czy-potrzebuje-wizy/.

Airport Information In Krakow there is an international airport - Balice, with good connections to the city center. It is also possible to arrive at the airport Fryderyk Chopin Warsaw - Okęcie, and then travel to Krakow by intercity trains (journey time is less than 3 hours).

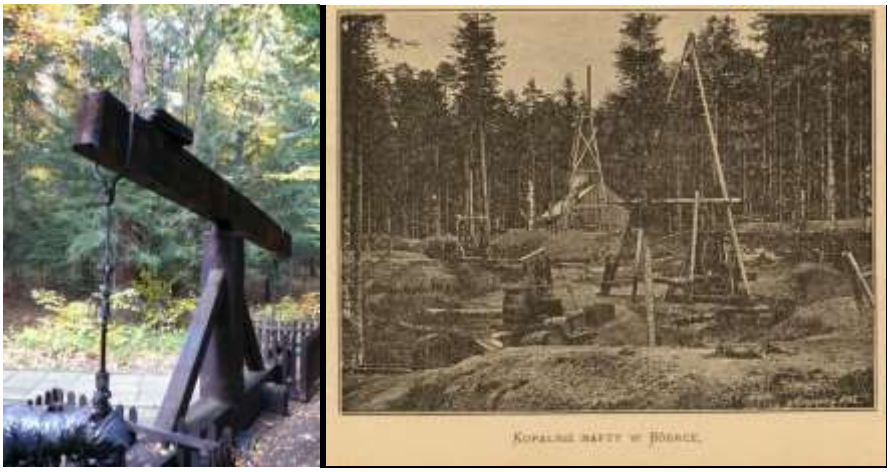
Hotel Information Krakow as a big tourist resort has a highly developed network of hotels of different classes. Detailed proposals will be presented in the second circular.

General plan for the pre-conference field trip – main sites to visit:

1 – Krzemionki Opatowskie in Holy Cross Mountains (place of extraction of striped flint from the Neolithic period);
2 – Tarnowskie Góry (Cracow-Silesia Highland) Zn-Pb – (Ag) underground mine – exploitation from the 16th century, - now tourist site;
3 – Złoty Stok (Sudetes) – gold mining from the 11th century – now touristic object with different options to visit;
4 – Kowary (Sudetes) - closed uranium mine and Gierczyn–Krobica (old tin mine)
5 – Walbrzych (Sudetes) – "Stara Kopalnia" (Old [coal] Mine - now: Science and Art Center.

SYMPOSIUM SCHEDULE

July 18, 2021 (Sunday) – arrival of the conference Participants;
July 19, 2021 (Monday) – Registration of Participants, Opening Session and first lectures;
July 20, 2021 (Tuesday) – Lecture sessions, Afternoon is possible to visit PAU Library with old prints and maps; in the evening a walk around Old Town in Krakow and official gala dinner;
July 21, 2021 (Wednesday) – full-day mid-conference field trip to Bóbrka Oil Mining Museum near Krosno – the cradle of the world oil mining. During the visit we will see the outdoor exhibition, including the exploitation of an oil field active since 60s of the 19th century, lecture prepare by Director of the Museum about history of oil exploitation in SE Poland (Carpathians), a film about Ignacy Łukasiewicz (in English), dinner at the Museum;



The Oil Mining Museum in Bóbrka (Carpathians): recent photo and photo from 1885.

July 22, 2021 (Thursday) – Lecture session on history of mining. This session will take place in underground Wieliczka Salt Mine (circa 15 km from Krakow). Wieliczka Salt Mine in in UNESCO Word Heritage list. This mine has been operating continuously since the 13th Century. Lunch and guided mine tour are planned;

July 23, 2021 (Friday) – Last lecture sessions, INHIGEO Technical Meeting, closing ceremony.

OTHER FUTURE CONFERENCES

HISTORY SYMPOSIUM: A symposium will be held within the 17th National Congress of the History of Science & Technology, in the city of Rio de Janeiro (July 21-24, 2020). It is entitled "History of geological sciences: knowledge and practices, agencies, agents and networks." There will be 10 papers presented, including some by INHIGEO members (Silvia Figueirôa, Margaret Lopes, Drielli Peyerl, and Mariana Waligora). For more information: https://www.17snhct.sbhc.org.br/simposio/view?ID_SIMPOSIO=147.

OTHER CONFERENCE REPORTS

Austrian Working Group "History of Earth Sciences" (AWGHES)

with the support of the Austrian Geological Society

On December 13, 2019, the annual meeting of the AWGHES was held in the Universal Museum Joanneum, Natural History Study Centre, in Graz with its topic "Geology and the Arts." This year the working group celebrated its 20th anniversary – reason enough to give a brief overview of the working group.

Twenty years ago, on February 21, 1999, the "constituent meeting" of our working group "History of Earth Sciences" took place at the then Institute for Geology and Paleontology (today: Institute for Earth Sciences) at the University of Graz. All the founding members agreed that this working group should be established in the frame of the Austrian Geological Society, but should be open to other scientific fields, in particular to the historical sciences, in order to make optimal use of synergies.

The first meeting of the working group was held on the day after the foundation. Since that time, the active working group has organized 18 annual conferences. While the first meeting was still taking place in the exhibition rooms of the mineralogical department of the "Landesmuseum Joanneum," the working group met again for the 10th anniversary at the now called "Universal Museum Joanneum." For the 15th anniversary of the AWGHES's existence, the working group met in the completely redesigned Joanneum district.

The 19th meeting took place in the Study Center for Natural History at the Joanneum on the northern outskirts of Graz. Since 2010 at this place all objects from all four natural science collections have been optimally accommodated in the most modern storage facilities.

The general theme of the anniversary event was "Geology and the Arts." The aim was to try to find divergences, but also similarities between science and different field of arts, like music, literature and painting.

A volume containing contributions of the meeting was published in "Berichte der Geologischen Bundesanstalt, 135" (see: https://opac.geologie.ac.at/wwwopacx/wwwopac.ashx?command=getcontent&server=images&value=BR0135.pdf).

The next meeting of the AWGHES will be held in the Krahuletz-Museum in Eggenburg in Lower Austria, on 13th and 14th of November 2020 themed "Geology and Myth." The relationship or contrast between geology and parasciences throughout history should be discussed, as well as the question of geological considerations of healing stones or dowsing rods as well as the effect or influence of lines of gravity. Magical or mystical places are also part of the conference. Some of them will be visited on December 14th as part of an excursion.

The 15th International "Erbe-Symposium Cultural Heritage in Geosciences, Mining and Metallurgy – Libraries – Archives – Museums" which should have taken place in Eggenburg in June 2020 has to be cancelled because of the Corona virus situation in Austria. It will take place in 2021.

In addition to the annual meeting the following article was published by members of the AWGHES:

Birk, Steffen; Fritz, Harald; Hubmann, Bernhard; Kurz, Walter: Das "Geologie-Institut" an der Grazer Universität während der Jahre 1997 bis 2019: Einblicke im Rückblick [The "Institute of Geology" at the Graz University from 1997 to 2019: Insights in retrospect]. – In: Hubmann, Bernhard; Kurz, Walter (eds.): Festveranstaltung zur Emeritierung von Werner E. Piller. – Berichte der Geologischen Bundesanstalt, 133, 21-3, Wien.

Some members of the AWGHES could finalize extensive publications in 2019.

1. Fritz F. Steininger, Johannes Seidl, Daniela Angetter: Aus der Frühzeit des paläontologischen Unterrichts in Wien. Franz Ritter von Hauers Vorlesungen am Montanistischen Museum (1845 bis 1848). [From the early days of paleontological teaching in Vienna. Franz Ritter von Hauer's lectures at the Montanistic Museum (1845 to 1848)]. – Berichte der Geologischen Bundesanstalt, 136, 258 pp., Wien.

At the Geological Survey of Austria, the later successor of the "Montanistische Museum in der Hofkammer in Münz- und Bergwesen," you can find in the archives of the library under the inventory number 173 with 11 fascicles the original transcripts of oryctognostic, mineralogical, crystallographic and paleontological lectures as well as those in analytical chemistry, given between 1843 and 1848 by Wilhelm Ritter von Haidinger, Franz Ritter von Hauer and Alexander Löwe.

The individual paleontological lectures given by Franz von Hauer between the years 1845 and 1848 can be found in the fascicles 173, 2 / VII and 173, 2 / VIII, each with 21 convolutes, which were written by students, especially mountain officials of the Habsburg monarchy. These convolutes contain, on the one hand, the systematic description of the organisms (animals and plants), which is often explained by sketches, and on the other hand the lithological descriptions of discovery places and their stratigraphic position. The convolutions of Faszikel 173, 2 / VII and 173, 2 / VIII were critically edited and provided with comments.

The above mentioned publication is supplemented by a short chapter about the "Montanistische Museum" and the lecturers given there as well as by some biographies, especially from Franz Ritter von Hauer and his father Joseph, and as far as could be researched about the students of the first paleontological lecturers.

2. Josef-Michael Schramm: Eberhard Friedrich Fugger (1842–1919) und die Humboldt'sche Geobiodiversität. Eine Würdigung des Salzburger Naturforschers zu seinem hundertsten Todesjahr. [Eberhard Friedrich Fugger (1842–1919) and Humboldt's Geo-Biodiversity. A tribute to the Salzburg natural scientist for his hundredth year of death]. – Berichte der Geologischen Bundesanstalt, 137, 117 pp., Wien.

The above publication pays tribute to Eberhard Fugger's achievements in the geosciences, particularly regarding the crownland Salzburg region, but also his outstanding activities in the fields of meteorology and seismic and other scientific subjects.

The 21st of August 2019 marks the 100th anniversary of death of the Salzburg natural scientist and teacher Prof. Dr. H. C. Eberhard Friedrich Fugger. Fugger focused his activities geographically on the former Austro-Hungarian Crown Land of

Salzburg and covered a wide range of scientific disciplines with his research in keeping with geo-biodiversity sense of Alexander von Humboldt: botany, geology, hydrography and hydrology, meteorology, mineralogy, mining, paleontology, seismology, speleology and zoology. His interdisciplinary scientific work includes more than 350 publications, with a focus on geology. In addition, he volunteered for example as curator of the Botanical Garden Salzburg, director of the Museum Carolino Augusteum (now Salzburg Museum) and earthquake consultant of Salzburg country. He also participated actively in the social life of Salzburg. Academic institutions and the public sector have given Eberhard Fugger numerous honors. For example, he was appointed 1878 as a "Correspondent of the Geological Survey" in Vienna.

3. Johannes Seidl: Geschichte der Geologe in wissenschaftshistorischer Perspektive. Von der Antike bis ins 20. Jahrhundert [History of the geologist from a historical perspective. From antiquity to the 20th century]. – Cardamina Verlag Susanne Breuel: Weißenthurm, 198 S.

The present study (above) deals with geological content and achievements from ancient Egypt and the two-river land to the evidence of the modern plate tectonics in the 20th century. However, the focus of the publication is not on a chronological sequence of the presentation of geoscientific achievements, but much more on the historical and intellectual history of the political, socio-, economic and intellectual foundations that made geological knowledge possible.

The history of the geological and scientific institutions is also mentioned, *e. g.* the development of the earth science institutes at the universities, the geological institute, the geological research at the Academy of Sciences in Vienna. The focus is also on the development of geological collections and the establishment of earth science associations.

4. Daniela Angetter-Pfeiffer and Bernhard Hubmann (Eds.): Quadrifolium. Festschrift für Johannes Seidl [Quadrifolium. Commemorative publication for Johannes Seidl]. – Vienna University Press: Göttingen, 332 S.

The title "Quadrifolium" of the commemorative publication for Johannes Seidl (No. 4 above) was chosen by the editors as a tribute to the diverse professional and scientific work of the jubilee and includes contributions to the following chapters "Archive History and Collection," "Medieval Studies," "University History" and "(Nature) History of Science". These research areas are underpinned by another field of activity, namely biography. The contributions were written by precursors and companions, work colleagues, but also by doctoral students. In the chapter on archive history and collections, Fritz F. Steininger's contribution on the collections in the Krahuletz Museum in Eggenburg combines the need for historical collections for scientific research, but also the importance of the archive work behind them.

Hannes Seidl's interest in media studies appreciates his colleague in the University Archives Martin G. Enne with a treatise on the Rhenish Nation at the University of Vienna. In her contribution, Elisabeth Köck deals with the market books of Perchtoldsdorf, the residential but also the temporary place of work of the honored person.

On the subject of university history: companions like Matthias Svojtka, who deals with the transition of the Faculty of Philosophy from introductory content studies to a real research structure; Gregor Gatscher-Riedl, who wrote in his article about the Jewish doctor; librarian and university student Oskar Franz Scheuer, Richard Lein, who paints the living image of a contemporary witness of the 1968 generation at the Geological Institute of the University of Vienna; as well as Wolfgang Rohrbach with a subject area that is rather unknown to the general public about the interactions between insurance companies and universities.

Hannes Seidl's multifaceted research on the history of geology, nature, science and, more recently, the history of medicine are the contributions of Günther Bernhard on the services of the tax on fortifications in the Archdiocese of Salzburg and Daniela Angetter, on the medical knowledge of the Novara expedition. This chapter is supplemented by Bernhard Hubmann's lyrical report from a geological excursion in 1950 by students from the University of Graz and Angelika Ende's contribution to the family history of Franz Strauss, as it were an appreciation of Hannes Seidl's extensive studies on Eduard Suess.

X Chilean Symposium on History of Geology

prepared by
Reynaldo Charrier and Francisco Hervé

Organized by the Geological Society of Chile, the X Chilean Symposium on the History of Geology took place in October 11, 2019, at the auditorium of the Agustin Ross Cultural Center of Pichilemu city, and continued the day after with a field trip to Paleozoic metamorphic outcrops in the region. Nearly 40 persons attended, including local persons. One-third of the participants were geology students from different universities in the country.

This symposium was mostly dedicated to the 50th anniversary of the discovery of the mineral glaucophane in the region of Pichilemu. Five talks were dedicated to this subject.

Apart from this important aspect related to the location region of the meeting, emphasis was made on the participation of women in the development of geology in Chile, and on the glaciological achievements of the French glaciologist Louis Lliboutry, who made much of his scientific work and discoveries in the Chilean Andes. A talk on the influence of geologic observations in the ancestral mapuche cosmovision was offered.

On Saturday the 12th of October, a fieldtrip was organized to the localities of Tanumé and Cahuil.

Abstracts in Spanish of the presentations can be downloaded from www.sociedadgeologica.cl

The group decided to hold the next symposium in about one year's time accepting the invitation of Universidad Arturo Prat, Iquique.

Presentations to the X Chilean Symposium on History of Geology, organized by the Geological Society of Chile. The Symposium flyer is attached.

PROGRAM

Friday, October 11th

14:30 – 15:00 Registration
15:00 – 15:10 Welcome address
15:10 – 15:25 Brief history on the initial professional activities of women geologists in Chile, with emphasis on the "pioneers". **Patricia Narváez D.**
15:25 - 15:40 Women in geology. **Nataly Freire and César Gonzales**
15:40 - 15:55 Creation and events in the Geology School at Universidad Andrés Bello, Santiago. **Tomás Reyes, Juan Bernal Wormull and Víctor Poblete**
15:55 – 16:10 The Huantajaya: The geological Ticsi in Tarapacá and a forgotten support in northernmost Chile. **Diego Rojo Martel and Paulo Quezada Pozo**
16:10 – 16:25 Glaciology in Chile: history and pending challenges **Felipe Ugalde and Cedomir Marangunic**
16:25 – 16:40 Louis Lliboutry: Life, feats and scientific contribution to science and glaciology. **Benjamín Carrillo and Valentina Medel**
16:40 – 16:55 The geological processes, faults and lineaments behind the nütram (mapuche myth) of Trentrén y Kaikai vilú. **Andrés Bastías Curivil**
16:55 – 17:10 The isolation of the Tierra del Fuego island. **Arenas, V. and Ramírez, E.**

17:10 – 17:30 Coffe break

17:30 – 17:45 The first geological research activities in the Tinguiririca valley, high Andes, central Chile. **Reynaldo Charrier**
17:45 – 18:00 Historical eruptive chronology of the Diamante-Maipo volcanic complex. **Carolina Silva Parejas**
18:00 – 18:15 The argentiferous San Pedro Nolasco District, Maipo river valley: History and Geology. **José Cabello**
18:15 – 18:30 A late reconnaissance to the Argentinean professors at University of Chile during the end of the sixties. **Estanislao Godoy Pirzio-Biroli**
18:30 – 18:45 Fifty years from the expulsión of the argentine "spies". **Edmundo Polanco Valenzuela and Aníbal Gajardo Cubillos**

18:30 – 18:45 Break

CONMEMORATION OF THE 50 YEARS OF THE DISCOVERY OF THE GALUCOPHANE MINERAL IN PICHILEMU

18:45 – 19:00 History of the discovery of glaucophano in Pichilemu. **Estanislao Godoy Pirzio-Biroli**
19:00 – 19:15 Pichilemu stories: figures and events after Estanislao Godoy discovered the glaucophane in the Pichilemu region. **Francisco Hervé**
19:15 – 19:30 Tanumé. A site for speleothems and their paleoclimatic implications for central Chile. **Diego Aguilera Marsh and Juan Bernal Wormull**
19:30 – 19:45 The Infiernillo georoute: a pilot Project of the Green Infrastructure Plan. (PIV) Pichilemu. **Simón Leisersohn**
19:45 – 20:00 Fifty years after the discovery of glaucophane in rocks of the Pichilemu region. History of the geological progress that identifies these rocks as part of a subduction complex. **Camilo Palape and Francisco Hervé**
20:00 – 20:05 *Closing words*

Saturday, October 12th

Field trip. Visit to the Late Paleozoic paired metamorphic complex; seeing Tanumé (high T°/low P metamorphic facies series rocks) and Infiernillo and Cahuil (high P/ low T metamorphic facies series rocks).

Chinese Commission of History of Geology in 2019

Under the leadership of Geological Society of China (GSC) and supported by China University of Geosciences (Beijing) (CUG) and other Societies, the Chinese Commission of History of Geology (CCHG) made much endeavors to carry out many activities in 2019. In particular, the Commission organized three academic symposia, held two exhibitions and five academic lectures, published a book, and conducted some other research projects as well.

Jointly organized by CUG, the 29th Annual Conference of CCHG was held in the International Conference Center of University on November 16, 2019. More than 80 delegates attended the conference, 38 papers were received, and 17 papers were read at the conference. Prof. Wan Li, Vice-President of CUG, and academician Zhai Yusheng addressed at the opening ceremony; Professor Deng Jun, Chairman of CCHG, made a speech at the end of the conference. Prof. Cai Keqin, Vice-Chairman of CCHG, summarized the conference at the closing ceremony.

Group Photo of the 29th Annual Conference of CCHG

On the occasion of his centennial birthday, an exhibition of Prof. Ma Xingyuan (1919-2001) was prepared by the CCHG in March 2019. Meanwhile, a related symposium was held on May 24, 2019. Many scholars attended the symposium, and the former Prime Minister, Mr. Wen Jiabao, a former student of Prof. Ma, provided a memorial article. Another exhibition of Prof. Zhang Xiangong (1919-2015) was also held in China University of Geosciences (Beijing) in April.

To mark the visit of Dr. Toshihiro Yamada, Vice-President of the International Commission on the History of Geological Sciences, a meeting was organized by the CCHG and attended by several members. The group discussed with Dr. Yamada Toshihiro topics concerning the academic exchanges between China and Japan.

Dr. Yamada Toshihiro (front row; second from right) visits China University of Geosciences (Beijing).

Several books have been edited by the CCHG:
1) *The Development of Chinese Geological Science* (draft);
2) *The History and Development Trend of the Research on the Regional Metallogenic Law* (draft);
3) *Collection of Papers of the 29th Annual Academic Conference of CCHG*; and
4) *The Collected Papers on History of Geology* (Series 7) has been published by the Geological Publishing House.

In addition, the CCHG successfully organized series popular lectures, including "The Early Development of Geosciences of China," "70 Years of New China's Petroleum Industry and Iron-man Spirit," "The Development of China's Geological Education in the 20th Century," "Natural Resources and Historical Culture," and "The Geological Investigation of Western Scholars in China and the Formation of Chinese Geologists (1850-1950)."

Yun Xuemei, China University of Geosciences, Beijing

French Committee on the History of Geology (Cofrhigéo)

In 2019, the French Committee on the History of Geology (Cofrhigéo) met in three sessions.

The session of March 13, 2019, was dedicated to the history of planetary geology, with the following 6 conferences (whose recording can be viewed at: https://www.youtube.com/playlist?list=PLkEe9tUEf6F51d1Sn7tE7m2-jT1Y9oaTs):

Sébastien DUTREUIL: De l'exploration spatiale à la constitution des sciences du système Terre: itinéraires croisés de la NASA, d'un chimiste et d'une biologiste [From space exploration to the emergence of the sciences of the Earth system: crossed paths of NASA, a chemist and a biologist].
Sebastian V. GREVSMÜHL: Missions spatiales habitées et terrains "analogues": perspectives historiques [manned space missions and terrestrial "analogues": historical perspectives].
Jacques TOURET et Nicole GUILHAUMOU: Succès et échecs de l'étude des inclusions fluides dans les roches extra-terrestres [Success and failure of the study of fluid inclusions in extraterrestrial rocks].
Jean-Pierre BIBRING: Explorer la Lune – et tout change sur Terre! [Explore the Moon - and everything changes on Earth!]
Sylvain BOULEY: Des terres du ciel aux exoplanètes [from the lands in the solar system to the exoplanets].
Nicolas MANGOLD: Curiosity: un robot comme géologue de terrain sur Mars [Curiosity, a rover as a field geologist on Mars].

The session of June 12th had the following talks:

Gregory TODD: Les fondations françaises de *Theory of the Earth* de James Hutton: Hutton et la chimie de Guillaume-François Rouelle [The French foundations of James Hutton's *Theory of the Earth*: Hutton and the chemistry of Guillaume-François Rouelle].
Pascal RÉTIF: Cartes géologiques et géologie du granite [Geological maps and geology of granite].
Cristiano FERRARIS: Correspondance entre les minéralogistes Sella et Des Cloizeaux [Correspondence between the mineralogists Sella and Des Cloizeaux].

Finally, the session of December 12th was devoted to the history of the geology in the late 18th and early 19th centuries:

Philippe TAQUET: Présentation de l'ouvrage: "Georges Cuvier. Anatomie d'un naturaliste" [Presentation of the book: "Georges Cuvier. Anatomy of a naturalist"].
Arnaud BRIGNON: Le rôle des collectionneurs dans la connaissance des vertébrés jurassiques de Normandie au XVIIIe et au début du XIXe siècles [The role of collectors in the knowledge of Jurassic vertebrates from Normandy in the 18th and early 19th centuries].
Maddalena NAPOLITANI: Les collections de Balthazar Georges Sage, fondateur et premier directeur de l'École royale des mines, entre sciences et curiosité (1783-1816) [The collections of Balthazar Georges Sage, founder and first director of the *École royale des mines*, between science and curiosity (1783-1816)].

HISTORY OF GEOSCIENCE SECTION - Geological Society of Italy

In 2019 the History of Geoscience Section organized and/or participated in the following congress and seminars:

January – Seminar on "Terremoti tra memoria e prevenzione", organized by INGV, in the framework of "Giornata regionale dell'alfabetizzazione sismica".
January – Seminar "Valle Giumentina Pleistocene site (Abruzzo, Central Italy)". 2nd Welcome Day, 34° doctoral cycle, EEH Disputer, Chieti-Pescara University (UdA), Chieti.
February – International Congress "Fortificazioni ed identità urbane", Polo Santa Marta, Verona University.
February – Congress "Dall'inchiostro ai Raggi X: le Scienze della Terra per immagini dal passato ad oggi. Darwin Day", 12-13 February 2019, Museo di storia naturale di Milano.
March – Seminar on "Storia della geologia e della cartografia geologica in Italia attraverso il patrimonio cartografico della Biblioteca ISPRA", Università di Torino.
March – Congress "Guido Bonarelli, esploratore e scienziato tra Ottocento e Novecento", in the framework of the inauguration of a road dedicated to Guido Bonarelli in Gubbio. Teatro Comunale "Luca Ronconi", Gubbio.

May – Seminar in the occasion of the 150th of the death of Tommaso Antonio Catullo (1782-1869). Aula Catullo del Dipartimento di Geoscienze, Padova University.

May –Round table "Metodo Scientifico e sua Attualità" into the series of conferences "A tu per tu con gli scienziati – Metodo □□□□□□□□□: le vie della conoscenza" organized by Associazione Briciole and La Nuova Limonaia, I.I.S. A. Meucci, Massa.

May – Congress "1969-2019 - Bruno Accordi e la scuola geologica romana: l'idrogeologia dell'Alto Bacino del Liri", dedicated to the 50th anniversary of the publication on the geology of Central Italy, held at Sapienza Rome University.

June – Seminar "Convegno divulgativo sul patrimonio storico e artistico della nazione", at the Teatro San Michele Arcangelo in Montopoli in Sabina (RI).

June – 13th International Conference on Military Geosciences, "Peace follows war: geosciences, territorial impacts and post-conflict reconstruction", Padua, 24 - 28 June. IAMG, Department of Historical and Geographic Sciences and the Ancient World (DiSSGeA) and Italian Society of Military Geography and Geology (SIGGMi), followed by a post-conference field trip on the Dolomitic area.

July –Session ST1.1 "History of Stratigraphy in Italian environments (17th – 20th centuries)" during the 3rd International Congress on Stratigraphy (STRATI 2019), Milan, 2-5 July 2019.

July – Exhibition "Quando i vulcani diventano antichi da Predazzo, 200 anni fa, Giuseppe Marzari-Pencati rivoluziona la teoria della Terra", Predazzo, 31 July 2019, Museo di Geologia di Predazzo. Organized by the Museo geologico di Predazzo in coopertaion with the Trento Film Festival and the exhibition curators.

September – Organization and participation at the 44th Symposium of the International Commission on the History of Geological Sciences, Varese-Como. Organization of the mid-meeting and post-congress field trip.

September – Organization and participation to the post-congress field trip of the 34th IAS Meeting of Sedimentology, Rome.

September – "European Night of the Research" with presentation on "Sotto i Sette Colli: 1) Le geoscienze romane dal XIX secolo all'avvento della tettonica globale; 2) Il progresso della cartografia geologica dell'area romana", RomaTre University.

October –Series of conferences dedicated to the relation between "Geology and History", in cooperation with Società Geografica Italiana, SIGEA, and ISPRA.

October - Series of conferences "I giovedì della Cittadella" with the comunication "Vesuvio 79 AD – L'eruzione che ha cambiato la vulcanologia", Cittadella Galileana, Pisa.

December – Presentation by Roghi G., Kindl U. and Infelise M. of the reprint of first edition of the book "La grande strada delle Dolomiti" by C. F. Wolf (1908), Museo di Storia Naturale di Venezia.

December – Celebration conferences for the centenary of the "Mining High School - Bernardino Lotti" in Massa Marittima, Tuscany.

December –Congress ASITA 2019. Session 10 - Cartografia e toponomastica storica. Trieste.

Publications 2019 (of the members of the Section)

Argentieri A. (in stampa) - Trevisan, Livio. Dizionario Biografico degli Italiani, Istituto dell'Enciclopedia Italiana fondata da Giovanni Treccani, 97, Roma.

Argentieri A. (in stampa) - Vardabasso, Silvio. Dizionario Biografico degli Italiani, Istituto dell'Enciclopedia Italiana fondata da Giovanni Treccani, 97, Roma.

Argentieri A., De Caterini, G. (2019) - Idrogeologia dell'alto bacino del Liri (1969): Bruno Accordi e la nuova scuola geologica romana - Upper Liri Basin hydrogeology (1969): Bruno Accordi and the new roman geological school. Acque Sotterranee - Italian Journal of Groundwater AS28-386: 67-75 (DOI 10.7343/as-2019-386).

Argentieri, G. Bianchini, G. De Caterini, C. Di Nisio (2019) - La Compagnia del Martello. Resoconto del convegno "1969-2019: Bruno Accordi e la Scuola geologica romana: l'idrogeologia dell'alto bacino del Liri" Professione Geologo-Notiziario dell'Ordine dei Geologi del Lazio, 57 (Luglio 2019): 8-11.

Bondesan A., Craig D., Pantaloni M., Petti F.M., Plini OP., Smit H. (2019) - 13th International Conference on Military Geology: Peace follows war: geosciences, territorial impacts and post-conflict reconstruction, Abstract volume. (DOI: 10.3301/ABSGI.2019.03).

Dal Piaz G.V., Argentieri A. (2019) - Sessant'anni del Traforo del Monte Bianco, la storia di un'impresa. Prologo: Da Annibale alle grandi gallerie alpine - Sixty years with the Mont Blanc Tunnel, history of an achievement. Prologue: from Hannibal to the great alpine tunnels", Acque Sotterranee - Italian Journal of Groundwater AS30-404: 67-73 (DOI 10.7343/as-2019-404).

Macini P., Mesini E. (2019) - La fortuna del petrolio di Montegibbio da Francesco Ariosto all'epoca moderna. Atti della Società dei Naturalisti e Matematici di Modena, 150. (http://www.socnatmatmo.unimore.it/download/Atti2019.pdf#page=33), ISBN ISSN 0365-7027.

Macini P., Mesini E. (2019) - L'ingegneria Mineraria all'Università di Bologna. In: Nascita e sviluppo dell'Ingegneria all'Università di Bologna (Cap. 2.31), Bononia University Press, Bologna, pp. 621-639, ISBN: 978-88-6923-449-1. http://amsacta.unibo.it/6276/
Mesini E., Mirri D., Macini P. (Eds.) 2019) - Nascita e sviluppo dell'ingegneria all'Università di Bologna, Bononia University Press, Bologna, pp. 952, ISBN: 978-88-6923-449-1.
Moretti M., Lisco S., Brandano M., Tomassetti L., Gravina M.F., Pantaloni M., Console F. (2019) – The Sabellaria bioconstructions and their Plio-Pleistocene substratum along the southern Latium coast (Tor Caldara, Anzio, Italy). *In:* M. Vigliotti, M. Tropeano, V. Pascucci, D. Ruberti, L. Sabato (Eds) Field Trips – guide book, 34th IAS Meeting of Sedimentology, Rome (Italy) September 10-13, 2019, Post-Meeting Field Trip IM6, 223-234. Associazione Italiana di Geologia del Sedimentario - GeoSed, Siena (Italy), ISBN 978-88-944576-0-5
Pantaloni M. (2019) - Stella, Augusto. Dizionario Biografico degli Italiani, Enciclopedia Treccani, vol. 94.
Pantaloni M. (2019) – Taricco, Michele. Dizionario Biografico degli Italiani, Istituto dell'Enciclopedia Italiana fondata da Giovanni Treccani, 95, Roma.
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Pantaloni M. (in stampa) – Viola, Carlo Maria. Dizionario Biografico degli Italiani, Istituto dell'Enciclopedia Italiana fondata da Giovanni Treccani, Roma.
Pantaloni M., Console F. (2019) - Il Ponte sfondato sul torrente Farfa (Sabina, Lazio). Rendiconti online della Società Geologica Italiana. 47/2019, 162-177 (DOI: https://doi.org/10.3301/ROL.2019.28).
Principe C., Paolillo A. (2019) - The Contribution of Historical Data to Cartography of Active Volcanoes. The Example of Vesuvius. IUGG, Montreal, Canada, 8-18 July 2019.
Principe C. (2019) - The contribution of Henry James Johnston-Lavis to the Monte Somma and Vesuvius Stratigraphy and cartography. STRATI 2019, Milano, Italy, 2-5 July 2019.
Principe C. (2019) - CORVO: A Corpus of annotated texts about phenomenology of European Volcanoes – an EUROVOLC/EPOS project. EUROVOLC M12 Annual meeting, Azores Islands, 17-22 February 2019.
Vaccari E. *et al*. (2019) - Program and abstract book. 44th Symposium of the International Commission on the History of Geological Sciences. 86 pp.

Marco PANTALONI (Roma)

HOGG Report for INHIGEO - 2019

The History of Geology Group (HOGG) is affiliated to the Geological Society of London (GSL) and has a current membership of c.120. The History of Geology Group (HOGG) was inaugurated in October 1994 to encourage interest in the lives and work of those scientists and philosophers who influenced both the study and the practice of geology. The Group is open to anyone with an interest in the subject. Currently, the chair is Duncan Hawley and the Secretary is John Henry.

In 2019, HOGG organised three meetings. In May, Cynthia Burek, U of Chester, and Bettie Higgs, U of Cork, co-convened a conference to celebrate the Centenary of the First Female Fellows of the Geological Society of London. In July, Tom Sharpe, former chair of HOGG and recently returned to Edinburgh, organised a two-day meeting jointly with the Edinburgh Geological Society on Aspects of the history of geology in Scotland and the north of England. Andrew McMillan and Beverley Bergman organised walks on the second day to show the local building stones and the haunts of James Hutton in Edinburgh.

In October, Duncan Hawley and John Henry co-convened with the Yorkshire Philosophical Society a conference on "The Genesis of Geology in York and Beyond." Day one consisted of morning lectures and guided visits behind the scenes of the Yorkshire Museum. We celebrated the 25th anniversary of HOGG with dinner in the Grand Assembly Rooms of York. On the second day Duncan Hawley led the field visits to Kirkdale Cave, where an early hyena den described in Buckland's *Reliquiaie Diluvianae* was discovered, and the long-abandoned Rosedale Magnetic Iron Mines.

James Hutton commemorative stone, Edinburgh.

The entrance to Kirkdale Cave.

The drawing of Kirkdale Cave by William Conybeare with William Buckland poking his head into a prehistoric hyena den, 1822, to celebrate Buckland's ground-breaking analysis of the fossils found in the cave. (https://en.wikipedia.org/wiki/Kirkdale_Cave).

In addition, HOGG takes part in the Geologists' Association annual Festival of Geology at University College, London each November, to show the work of our members and distribute leaflets. HOGG publishes three Newsletters a year packed with reports of recent meetings, news of forth-meetings and reviews of books and exhibitions relevant to our members.
HOGG's website: www.historyofgeologygroup.co.uk and its group email serve the majority of members for more immediate news.

John Henry, 12th April 2020.

NOT JUST ONE COALFIELD, BUT TWO:
THE HISTORY OF GEOLOGY AND MINING IN THE FOREST OF DEAN.

Report of the HOGG weekend (May 19th–21st 2017) field trip led by Cherry Lewis, Ian Standing and David Green

Prepared by Brian Roy Rosen[1]

Where is the Forest of Dean? It's still back there. It's a sort of mythic Forest of Dean. There's the real one (laughs), with the same signs and stresses as the real anywhere, and there's the other one, the one I grew up as a small child in, and those rather ugly villages in beautiful landscape. Just accidentally a heart-shaped place between two rivers, somehow slightly cut off from them, the rest of England and Wales on the far side, the other border ...
Dennis Potter (born Forest of Dean 1935) in interview with Melvyn Bragg.
(https://www.theguardian.com/theguardian/2007/sep/12/greatinterviews)

On the few occasions I have been to the Forest of Dean (hereafter 'FoD', as in my student-days' geology notes), mostly when I was a lot younger, I have been struck by the extent and depth of its mostly deciduous woodland, sometimes even to the point of feeling somewhat oppressed by it. Roads crossing the relatively high topography rarely yield views, as we found as our field trip bus wound, seemingly interminably, amongst the stately trees of the Forest, forever confusing our sense of direction. But I suppose it gives some idea of what much of Britain must have looked and felt like in the past, before farming and other land use took their huge toll, leaving the FoD as one our few notably large remnants of ancient woodland, along with, for example, the New Forest and Sherwood Forest.

Compared with the large, more heavily populated, busier and lower-lying, more open areas surrounding the FoD today, you enter a very different ambience of dark seclusion—even isolation and remoteness— as you climb into its rolling, densely wooded hills. Even the few townships of its interior seemed rather lost in a former time, reminiscent of those in much more distant parts of the British Isles. Geography is the clue. This is also a mini Mesopotamia, set between the two major rivers of the Wye and Severn, carrying large volumes of often fast flowing water out of the wetter regions of their Welsh hinterlands—rivers prone to flooding and difficult to bridge. This was a major challenge to those who wanted to develop its rich coal and iron resources. The roads linking it to the outside world were few and frequently impassable, and the hilly terrain was unfavourable for canal-building. Even today, the recommended eastern approach by road forced us into a southward dog-leg before allowing us to climb into the Forest to the well-known **Speech House** [SO 620 121] where our field trip party was booked to stay.

The writings of Dennis Potter, widely known as a playwright son of the FoD, relate to social factors of its geography and relative isolation. But also, his father was a coal miner, and as we saw, mining is still one of the two main occupations of the Forest (the other, unsurprisingly being Forestry), and this links us to the main aims of the trip. Obviously, we came not to praise Potter's dramas, but to consider some true-life dramas acted out in the FoD especially during the late 18th to mid-19th centuries. In a broader context, this time period witnesses the emergence both of modern geology and of factory systems of industrial production in what might be thought of as the 'New Iron Age'. Casting our minds back to this time, we have to think how the glittering economic, commercial (hence speculative) prizes of the day were the resources of coal and iron, the importance of which, to Britain at least, has now almost faded away, even from collective memory. Yet the basic principles of geological mapping, so essential for finding these resources, were only just being established. How successfully did the combined efforts of the contemporary men (mostly) of iron and money, engineers and industrialists, overcome this, as well as the fastnesses of the FoD, to hit this coal-and-iron jackpot?

This trip was convened by Cherry Lewis "to comprehend what it was like trying to find iron and coal when the geology of the area was poorly understood." Notably, some of the key characters in this drama came from elsewhere: Dalkeith (David Mushet), Bedford (John Farey Snr) and Churchill, Oxon (William Smith). Cherry co-led the trip with Ian Standing (local industrial history) and David Green (local geologist), making up a nicely balanced trio of complementary expertise which also led to excellent discussions in the field (Fig. 1). Trip participants were also given the guides' comprehensive 25-page itinerary guide (Lewis *et al*., 2017) put together by them with much care, breadth and fascinating attention to detail. This is not just a mine (ha-ha!) of useful information, but a valuable document in its own right which, though as yet unpublished, should surely be made more widely available in due course.

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Figure 1. Dave Green explains the geology of the Forest of Dean.

At our first stop [SO 605 048] on the first day, we visited two sites close to each other. We entered a deep oak wood to view the remarkable **Devil's Chapel Scowles** near Bream and also **Chelfridge lime kilns** (Fig. 2) just on the further edge of the wood, with a fine view of the house at Chelfridge, and just a glimpse of the River Severn in the distance. Lime burning is quite ancient, but here the attractive double brick structure is probably 19th Century in age. It is no longer used and is in need of conservation work. Limestone for the kilns would have been readily available from the Lower Carboniferous outcrops in the immediate area.

Figure 2. Chelfridge lime kilns.

The Scowles (Fig. 3) were one of the two most outstanding scenic features of the trip (the other being the Old Red Sandstone scarp just E of Monmouth— see below), and in various senses, a mystery. Certainly, the deep wooded atmosphere of numerous small, irregular, rugged, reddened limestone crags, separated from each other by a labyrinth of deep clefts and hollows, all covered by moss, undergrowth and leaf litter, and hemmed in by trees, evokes myth and mystery, even before embarking on the real riddles of their scientific and historical origin. Great trees even grow atop some of the rocks, with their roots wrapped around them, looking like overgrown bonsai or Chinese engravings of tower karst. It is no surprise to discover that these, and other scowles in the FoD, have been used as locations for all the obvious science fiction films and series (Harry Potter, Doctor Who, Star Wars, Lord of the Rings, Blake's Seven) as well as Midsummer Night's Dream.

Figure 3. The Scowles.

But our party soon became animated about science fact rather than fiction (Fig. 4). Are the clefts simply natural weathering of joints in the limestone, or are they old workings, possibly as old as Roman, for the iron ore which typically inhabits such joints in many parts of the FoD area? A combination of both seems most likely. Modern techniques of rock-surface dating, now well established, might help to clarify human and natural processes.

Figure 4. The animated party.

We continued to think about these questions at our next stop, the outstanding working mining museum, a little confusingly known as Clearwell Caves [SO 578 082] just S of Coleford (Fig. 5a). Here we were guided by Jonathan Wright (Fig. 5b who operates the mine here. His explanations were fascinating and broad-ranging, including the mine operation itself, and the history of iron mining and miners in the Forest. He told us that he himself was a Free Miner of the Forest of Dean, and what that meant, now and in the past. Mines and caves don't suit everybody's idea of a nice day out, and just for a moment, the rambling complex system of caverns and galleries with various small, often rather makeshift-looking railway systems running here and there throughout the mine, conjured up the frisson of Indiana Jones' encounter with the crazy violent mine and its subterranean roller-coaster beneath the 'Temple of Doom'.

a.

b.

Figure 5. (a) In Clearwell Caves; (b) Jonathan Wright demonstrating how to hold a 'Nelly' (a traditional FoD miner's clay candle holder).

However, the parts Jonathan took us through at least, all felt reassuringly calm, solid, and roomy, and were well enough lit, with much to see by way of artefacts and explanation boards. There is even a small entertainment venue. You can find 'living fossils' here too in the form of a recently installed highlight exhibit of an animated, scientifically-researched, two-dimensional succession of ghostly-white translucent Carboniferous fish, goniatites (Fig. 6) and crinoids. I wish we had this technology available to us when I was helping to specify content for the From the Beginning gallery at the Natural History Museum.

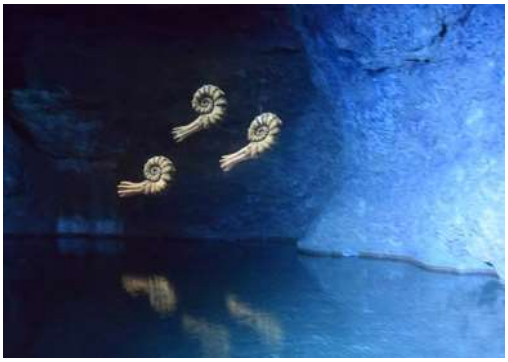

Figure 6. Part of the exhibit with the goniatites.

In fact, Cresswell Caves are at least in part a complex cave system which probably formed initially in Permian times along dissolved-out joints in the Crease Limestone (Chadian, Lower Carboniferous). This became lined not only with the usual kinds of cave limestone deposits but also iron ores, derived perhaps from weathering of iron-rich rocks exposed on the Permian land surface, creating a kind of downward, underground continuation of the similarly mineralized scowles we saw earlier. Then going back perhaps as

much as 7,000 years, miners entered this cave system, and added to its complex warren, much of it now penetrating much further, far deeper and far less accessibly than what visitors normally see. Iron ore was mined until 1945, but remarkably perhaps, this has also been a pigment mine—and still is. The iron ores and iron-rich clays of Cresswell are a source of luscious-coloured ochres. It is intriguing to think that the heavy labour and industrial tools and machinery of mining, here yield prized materials which end up being delicately used by artists on their canvasses, which perhaps eventually become world famous, valuable works of art.

From iron as raw ore, we progressed after our packed lunches at the Cresswell Caves café (and the only time it rained during the trip), to a story of failed endeavour and speculation about iron-the-metal by 'men of iron' at the ruins of **Whitecliff Ironworks, Coleford** [SO 568 102] as told by Ian Standing. The first replacement of long-used charcoal for iron-smelting by coke (1709) is generally attributed to Abraham Darby I (1678–1717) in Coalbrookdale, Shropshire, possibly following earlier efforts by some of his family predecessors. But strangely perhaps, there was a century lag before this method reached the FoD here at Whitecliff, through local ironmaster James Teague. Was this lag a reflection of the FoD's relative isolation? Teague collaborated with outsiders from Shropshire, and further impetus to improve his furnace came from other outsiders in the form of London-based stockbroker, Thomas Halford, and Scottish metallurgist, David Mushet. But by 1816, it was all over, leaving nature to turn the furnace into a romantic ruin, happily however, now being properly conserved in stages as a Scheduled Monument (Fig. 7).

Figure 7. Whitecliff Ironworks, Coleford

We next moved from iron and ochre pigments to consider two further important resources of the FoD— building stone and coal—by walking between a number of sites in the **Bixslade Valley** [SO 605 099]. From where our coach parked [SO 60511 09996] near the **Forest of Dean Firms Stoneworks** yard at Parkend at the southern end of Cannop Ponds, we walked along the remains of the local horse-drawn narrow gauge tramway (Bixslade Tramroad, 1812 onwards) which preceded the steam railways of the area (now gone, too, apart from preservation lines). This was a plateway (L-section rails) laid on still visible stone setts in place of sleepers, carrying wagons with unflanged wheels, as we saw later at the Dean Heritage Centre. We reached the locked gates of **Mine Train Quarry** [SO 60186 10060] to peer through them at quarry faces in reddened Pennant Sandstone (Upper Carboniferous, Upper Coal Measures, Westphalian D or Asturian). Use of this fine, well known and widely used blue-hearted building stone goes back at least to the Bronze Age. The building-stone term 'Pennant Sandstone' is used for almost all of these kinds of Coal Measures sandstones throughout the FoD, South Wales and the Bristol area (analogously to 'York Stone in the N of England). They are fluviatile in origin, sometimes deposited in channels, and occur at many levels in association with coals and shales. Examples of the stone's attractive range of uses can be found at https://www.fodstone.co.uk

In the same immediate area, we also saw the closed-off adit entrance to **Bixslade Low Level Coal Mine** [SO 60166 10029], the history of which brought together the efforts of William Bradley, David Mushet, Thomas Halford and also William Smith to tackle the geology both locally, as well as for the FoD as a whole, culminating in Mushet's spectacular geological column and cross-section, just a few years before Smith published his great map (1815) of the geology of Britain. The mine, dating back to 1809, extracted coal from the Coleford High Delf seam (Westphalian D or Asturian).

We then paid our respects at the moving sculpture [SO 60281 09998] (Fig. 8) commemorating the tragic loss of miners in 1902 in a sudden flood in the workings of Union mine nearby, which worked the same seam.

Figure 8. Sculpture memorial to lost miners.

Finally, we looked around the little area of surface plant and installations around the entrance to the relatively modern (1980) **Monument Mine** [SO 60319 09966], a drift working for the Yorkley Coal (Westphalian D or Asturian), tens of metres higher, stratigraphically, than the High Delf. Coal and iron mining concessions ('gales') in the FoD are granted according to rules of the Royal Forest of Dean Free Miners Association which goes back to medieval times. In the recent past, these rights have been upheld in a conflict when the Government of the day tried to close down all the coal mines in Britain. The site of Monument Mine (Fig. 9) was a delightfully quirky, not to say rather makeshift-looking, set-up, with apparently improvised structures made of salvaged bits of old road vehicles, corrugated iron and seemingly almost anything else that could be pressed into use. Narrow gauge railway tracks and a hand-worked turntable complete the scene, which looks more like a film set for an old Wild West gold mine than a classic British pit-head, and is also the kind of thing that inspires a certain kind of model railway enthusiast. Nevertheless, it is evidently a going concern for the three-man team who work this mine, who use an electric mechanised coal-cutter.

Figure 9. The entrance to the Monument Mine.

We rejoined our bus at the **Forest of Dean Firms Stoneworks** (above) after looking around their site (not open) where the quarried Pennant stone is cut, prepared and stored for sale. By the public car-park however [SO 60721 09963], there were plenty of slabs stacked up outside the yard for us to inspect the stone, and plenty of scattered waste for us to pick over for souvenirs.

Our last stop of the day was at **New Fancy** [SO 629 095] in the heart of the Forest, which was once the site of a substantial coal mine which began operations in the mid-19th Century. There's now little here to suggest this once-extensive industrialised site. Even most of the waste tips have been removed, and the remaining waste has been turned into a pleasant reclaimed landscape in a kind of gentle wooded amphitheatre, reverted to a natural and older FoD landscape. On its flat floor is a geological map (Geomap) of the Forest of Dean, paved with rocks representative of its stratigraphy. This was ideally suited for a spontaneous group photo taken by our coach driver (Fig. 10).

Figure 10. Group photo taken at New Fancy.

The map (on which the group is standing) shows the former railways and the numerous sites of mines and quarries. We also went up on to the viewing point, well known to goshawk watchers (but we saw none ourselves), which further confirmed for us the sheer extent of the forest, both ancient and planted (Fig. 11).

Figure 11. A view over the forest area.

Our first stop on the next day was for some important and striking outcrops forming the north-western scarp of the FoD above the River Wye, to see the Quartz Conglomerate of the Upper Old Red Sandstone (Upper Devonian: Famennian). Leaving our bus, a short walk through the forest brought us dramatically to the scarp edge itself at the **Near Hearkening Rock** [SO 543 140] (Fig. 12). By some strange trick of acoustics, probably due to the sound-focusing effect of its partly concave vertical surface, people standing by it could (can?) hear others talking about a mile away. The area was therefore 'bugged' in effect, by natural causes, allowing gamekeepers to listen-in on poachers, and Royalist soldiers to listen-in on Roundheads during the Civil War. There were many other things here, however, of greater immediate significance for our party. We had a good discussion about the depositional environment of these relatively mature cross-bedded conglomerates, postulating flash floods, alluvial fans, rapid fluviatile deposition in braided channels, or some combination of these. A large isolated block (**The Suck Stone**), tens of metres down the scarp face below the crest, had evidently fallen from the outcrop proper. We discussed the cause and timing of the fall which seems to have happened without human witness, so we speculated that it was due to release of the block when ice or tundra conditions retreated in the Pleistocene. Or perhaps it fell from a former face of the scarp when it was destabilised by uplift and/or by downcutting by the River Wye just below us, during a rejuvenation stage. (The Wye famously follows a superimposed and incised course through the FoD.)

Figure 12. The Harkening Stone (Quartz Conglomerate, Upper Old Red Sandstone).

From the Quartz Conglomerate cliffs, Cherry took our minds back in time to understand the confusions that built up, historically, in the task of understanding the stratigraphic position of the Quartz Conglomerate in relation to British coalfield geology in general. This brought together a chain of loose collaborations and influences between Mushet, who was trying to synthesise his knowledge of the FoD geology, Farey who was doing much the same in Derbyshire, and Smith and Greenhough, both of whom were attempting to produce the first geological map of the whole country. A further issue was the apparently similar marls, which in different parts of the country seemed always to overlie coals. Although Farey championed Smith's use of fossils to distinguish the stratigraphy of otherwise similar lithologies, there were not enough fossils (well, macrofossils) in the marls or the Quartz Conglomerate for them to make this possible. In summary, Mushet concluded (alarmingly as it would seem to us today) that there must be another set of coal-measures stratigraphically beneath us where we stood on the Quartz Conglomerate.

Afterwards, we proceeded to **Hopewell Colliery** [SO 603 114], another working coal mine in the same Yorkley seam as Monument Mine, but as a bigger operation, and also one where visitors like us can be taken on underground tours. Hopewell is also much older (1823). We split into two parties each guided by different miners (Figure 13) and entered the mine through different adits, to meet up at the single current working coal face. Although we could just stand upright in the galleries themselves, the Yorkley seam here is only 18 inches (450 mm) thick and worked by the miners lying on their sides. As with every mine of any kind that I have ever visited in Britain, including Cresswell the day before, this was a time for guides to reflect on the very sobering subject of working conditions past and present. Considering that slavery was abolished by Britain in 1833, it took nearly another decade before the first Mines Act began to improve slavery-like working conditions in mines, starting with prohibition of all females, and boys under 10, from working underground. Mushet himself gave evidence which led to this Act. A particularly interesting mitigating detail about conditions in the FoD coal mines in general is their relative safety on account of only rare occurrences of the explosive gas methane ('firedamp').

Figure 13. One of the two parties with the guide.

We got back to fresh air by taking a short walk down a former railway track to see the ruins of **Dark Hill Ironworks** [SO 591 087] near Coleford. With the track somewhat higher up on a later embankment of the Severn & Wye Railway that cut across Mushet and sons' industrial site, it was like those classic views looking down on various ruins of ancient Rome. In the end, nature does not distinguish the age of the ruins it overgrows. Ian (Fig. 14) explained that this was Mushet and sons' site of metallurgical experiments as they sought to improve the quality of iron smelting and production of other metals over the next few decades following the first iron furnace in 1818 or 1819. Financial problems brought their efforts to a close. Other uses followed but the site became a ruin after 1928.

Figure 14. Ian Standing addressing the group at Dark Hill Iron Works.

Our final stop, appropriately, was at the **Dean Heritage Centre** [SO 665 105], in an attractive set of former mill buildings on one side of a mill pond, at Soudley, south of Cinderford. The exhibits added to our understanding of many of the things we had seen in the field and gave us a chance also to catch up a little with the natural history of the area. For those who needed it, there was also scope for a little retail therapy, to buy some FoD keepsakes. But the main objects were to look at **Thomas Sopwith's geological model** of the FoD (Fig. 15), and for the archivist and Ian to show us important documents of Mushet and Sopwith in the archives relating to this. In the 1830s, Sopwith made two three-dimensional block models of the FoD, this, the larger one, being on permanent loan from the Sedgwick Museum, in the University of Cambridge. Having learnt so much geology in my student days from the sadly long-gone block models that once graced the former Geological Museum in South Kensington, I wondered if Sopwith was the first to devise this didactic way of demonstrating the geological structure and stratigraphy of an area. Unfortunately, it is difficult to view the

model conveniently from all angles in its present location and it is hoped that this can eventually be remedied by a move to somewhere more suitable within the Centre.

Figure 15. Thomas Sopwith's geological model.

It is fitting to end this report proper by pointing out that by the time Sopwith was making his models, Mushet had realised and corrected his 'double coal-field' problem, and the accuracy of Mushet's geological work (though a metallurgist himself) still stands in its own right.

All in all, this was an outstanding, exciting, interesting and adventurous field trip with not just one coalfield but two, and not just one descent in Hades, but two, as well as numerous zig-zag journeys back in time from a century or so ago to 370 million years ago. Who else but historians of geology can do all that?! This really was a 'Forest of Dean Experience' as the travel brochures might have called it. It was also a major surprise for me at least to see that coal is alive and well in this part of the country, notwithstanding the efforts of successive governments, and now environmentalists, to terminate our coal mines (whatever our views on that). We gained lively insights into how the problems connected with the birth of modern geology were thrashed out on the local scale, as well as the struggles to make it all pay through industrial innovation and exploitation. The expertise made available to us by all three leaders, as well as others who conducted particular tours, was impressive and everyone was rightly full of praise for them and their work in preparing and running this ambitious and unusual trip. *NB Unfortunately, I have no record of the names of the miners who showed us around Hopewell Mine.*

REFERENCE

Lewis, C., Standing I., & Green, D. 2017. The history of geology and mining in the Forest of Dean. History of Geology Group field trip, 19–21 May 2017. Unpublished guide produced for field trip participants. 25 pp.

NOTES: *The field guide by Lewis* et al. *(above) should be consulted for further reading, and it contains numerous references. I have used a few of my own, mostly BGS publications and BGS online resources. Although I have drawn heavily on the field trip guide for this report (accurately I hope), I have also introduced facts and thoughts of my own as well as reporting points made by others during our discussions in the field. The leaders of this trip are obviously not necessarily responsible for information, ideas or mistakes which were not in their guide.*

PETROLEUM HISTORY INSTITUTE ANNUAL MEETING AND FIELD TRIP
SAINT JOHN, NEW BRUNSWICK, CANADA, JUNE 27-29, 2019

Participants of the PHI meeting on the steps of the New Brunswick Museum in Saint John, New Brunswick, the location of the geologic collection of Dr. Abraham Gesner from the 1840s. (Photo by Marilyn Black).

A small but lively group gathered at the Hilton Saint John, located on the waterfront of the lovely city of Saint John, New Brunswick, on June 27th for the 18th meeting of the Petroleum History Institute in the *Land of Abraham Gesner*. Dr. Gesner is the first person in North America to produce what he called *kerosene* in 1846 which helped to create the modern oil and gas industry.

The meeting opened with a Thursday evening reception and then on the Friday there was a half-day symposium[2]. At the symposium the group heard a variety of papers, *e.g.* Joyce Hunt, Co-chair of the meeting, told the group about growing up in the local area and visiting the Albert Mines, where Dr. Gesner obtained the original raw material, a solid bitumen called *albertite*, from which he made the first kerosene; Grant Wach, of Dalhousie University outlined "The History of Petroleum Exploration on the Scotian Margin and the Sable Field Development"(co-author David Brown), and also he told the group about role of two men, Hans Kugler and John Saunders, in the early petroleum exploration in Trinidad; Jeff Spencer gave the group an introduction to Canadian postage stamps related to the oil and gas industry, including one devoted to Dr. Gesner.

Abraham Gesner: Father of the Oil Industry; Commemorative postage stamp (Millenium Souvenir Collection) Canada Post Corporation, © 2000; Design concept: Steven Slipp CGD; Illustration: David Preston-Smith

Dr. Harry Giles explained the, "Advances in 19th Century Petroleum Chemistry." The luncheon Keynote address was also from Dr. Grant Wach, "Dr. Abraham Gesner FGS – Horse Trader, Government Agent, Physician, Scholar, Geologist, and Father of the Petroleum Industry," and it was interrupted by an unexpected guest, Dr. Gesner himself came in the room, complete with his bowler hat and long coat (he had an amazing resemblance to the Co-Chair of the meeting, Bill Brice - see photo) and complimented Grant on his talk.

[2] For the full meeting report, see *Oil-Industry History*, v. 20, no. 1, 2019, p. 1-16; for the meeting abstracts, same issue p. 85-88.

"Dr. Gesner" listening to the story of his life. (courtesy of Marilyn Black, PHI Secretary)

In the afternoon, Olivia King and Matt Stimson, members of the Museum staff, took the group on a tour of the research collections of the New Brunswick Museum (see main photo), which includes a major portion of Gesner's original museum collection which he opened to the public in 1842; many specimens still had Gesner's original labels. That evening at the Awards Banquet, Dr. Wach was presented with the *Gerald M. Friedman Award for Excellence in Oil History Presentation* for his presentation about the exploration on the Scotian Margin and Sable Field.

The Saturday field trip took us to the Albert County Museum and R. B. Bennett Centre where Ms. Janet Couston, the Managing Director, gave a tour of the various indoor and outdoor exhibits. Matt Stimson and Olivia King took us to a quarry where pieces of the solid bitumen could be collected, and later showed us a site that was rich in fossil fish. But the highlight of the trip was when Mr. James Upman, from the Moncton Museum, took us into the original Albert Mine site. Neither the mud nor the mosquitos could take away the thrill we all felt as we stood on the site where a substance was found that, literally, changed the world; and it was here right beneath our feet. Although later he used coal as a starting material, it was from this albertite that in 1846 Dr. Gesner created the first kerosene in North America. The change did not come immediately, but change it did, and we all felt a little chill as this thought settled into our minds as we collected our samples.

Grant Wach displaying a small piece of albertite that he found.

After a muddy walk back to the bus and a return to Saint John, the meeting came to a close; with expectations of seeing everyone again in Santa Barbara, California[3], in 2020.

Submitted by William R. Brice, Co-chair

For more information about the Petroleum History Institute, please see: www.petroleumhistory,org.

[3] Due to the Covid-19 pandemic of early 2020, this meeting was cancelled and rescheduled for 2022. PHI will meet in Pittsburgh April 29-May 1, 2021.

AWARDS

In October 2019, the Russian Geological Society (founded in 1992) awarded **Zoya Bessudnova** the *Aleksander Fersman Medal* for Merits in Geology. The Medal is awarded for many years of fruitful scientific and production work in geology, active public position in the field of popularization of geological knowledge and the profession of geologist.

Barry J. Cooper – *2019 Bruce Webb Medal*

The Bruce Webb Medal has been presented annually since 2005, and commemorates the life and work of Bruce P. Webb (1926-2000) who committed all of his professional life to studying geology, and later managing and leading, a wide range of businesses, government agencies and educational institutions involved with geology in South Australia. The Bruce Webb Medal is awarded by the Geological Society of Australia (South Australian Division) to a person distinguished for: Leadership that has advanced the earth sciences either within South Australia or from a South Australian base; and/or Contributions to the advance of knowledge within the earth sciences either within the State of South Australia or from a South Australian base.

INHIGEO President (2016-2020), Barry Cooper, was awarded the Bruce Webb Medal in 2019.

Barry is a professional geologist who gained a Master of Science from the University of Melbourne, Australia in 1972, and a Doctor of Philosophy Degree from Ohio State University, USA in 1974. Subsequently, he has made a significant contribution through 45 years employment in the earth sciences. He retired from the Geological Survey of South Australia in 2009 and currently continues professional involvement as an Adjunct Research Professor at the University of South Australia in Adelaide.

Barry has published approximately 200 geological and historical papers in his chosen fields. His research has focussed on palaeontology, stratigraphy, heritage stone as well as the history of geology. Editing of two volumes of the U. S. based journal *Earth Sciences History* dealing with the history of geology in Australia were published in 1986 and 1987 as well as a volume dealing with the national history of the Geological Society of Australia published in 1994.

Barry has also been active in professional circles at an international level having held the posts of Secretary General of INHIGEO and the "Heritage Stone Task Group" (HSTG) of the International Union of Geological Sciences. Barry is also INHIGEO President (2016-2020).

Within the Geological Society of Australia (GSA), Barry has been national Treasurer as well as Chair, Secretary and Editor of its South Australian Division. He was also Founder and the Founding Chair of GSA's History of Geology Specialist Group, which has flourished nationally since 1983.

Algimantas Grigelis: On July 6, 2019, the Day of the State celebration, Academician Grigelis was awarded *The State Gediminas Order* for remarkable achievements in science and culture development of the Republic of Lithuania.

Algimantas Grigelis (born 1931), geologist and palaeontologist, historian of sciences, traveller and photographer, graduated in geology the Vilnius University (1954), defended his Ph.D. thesis (1958) and the Doctor Habilitus Dissertatio (1981) on stratigraphy, micropalaeontology (Foraminifera) and geological history of the Jurassic System. Talented and hard working Algimantas Grigelis succeeded to reach the top of his science. He collected microfossils and worked as micropalaeontology expert in Sweden, Poland, France and other European countries, in Russia and Caucasus, Timan-Pechora region, Taimyr Peninsula in Siberia, Syrian Arab Republic, Eastern Canada and its Atlantic margin, travelled in Alaska and Chile Andean Cordilleras. He compiled the set of geological maps of the East Baltic region, took part in marine geological mapping expeditions in the Baltic Sea. Over the last few decades, he has actively

worked in the history of sciences and is author and co-author of more than 30 monographs. Dr. Grigelis has been awarded two State science prizes and the *Theodor von Grotthuss Medal* in 2018.

Sandra Herbert: Received the *Sue Tyler Friedman Medal* from The Council of the Geological Society of London for 2020. The Medal is awarded for "distinguished contributions to the recording of the history of geology."

On March 22, 2019, **Cornelia Lüdecke** received the *Paulus Preis* of the Deutsche Meteorologische Gesellschaft for her paper on Luke Howard's classification of clouds (1803). That prize is awarded only once every three years for a work in the history of mineralogy particularly strongly based on the use of original historical sources.

AD MEMORIAM

Professor Stepan T. Badalov

Commemorative Lectures honoring the 100th anniversary of the birth of the eminent geochemist and mineralogist, Honorary member of the Russian Mineralogical Society, **Professor Stepan T. Badalov**.

Stepan Badalov in his office, early 1990s

The lectures devoted to the 100th anniversary of the birth of Professor Stepan T. Badalov, the geochemist and mineralogist, and honorary member of the Russian Mineralogical Society, were held on 26th September 2019, under the aegis of the Moscow branch of the Russian Mineralogical Society, with active support of the management of the N. M. Fedorovsky All-Russian Institute of Mineral Resources (VIMS). The lectures were held in its main conference hall.

General Director of VIMS, Professor Grigory A. Mashkovtsev, started the lectures with an introductory speech. He addressed the audience with a historical synopsis of the geological science in both the USSR, and in modern Russia, highlighting the importance of continued co-operation with former USSR Republics in the area of geological studies.

VIMS Institute has a long-standing tradition of hosting scientific lectures in memory of a number of distinguished scientists. Since the entire scientific track record of Professor S. T. Badalov was tightly connected with the Central Asia, and in particular the Republic of Uzbekistan, G. A. Mashkovtsev welcomed the expansion of both the number of scientists taking part in the lectures and their geography, as well as the Uzbek guests who came to take part in the commemorative lectures. He wished the speakers every success in their lectures and expressed his view that the lectures in memory of Professor S. T. Badalov be held again going forward.

The first report delivered by one of the first graduate students of Professor Badalov, Head of Geotechnology Department of the Institute of Geology and Geophysics at the Uzbek State Geology Committee, Dr. Arpai. H. Turesebekov, summarized the scientific record of S. T. Badalov in the Institute of Geology and Geophysics from 1946 until 2014, focusing on his vast successful scientific career, underpinned by his strong goal orientation and energy in achieving new scientific knowledge, writing 5 monographs and over 500 papers, setting up a scientific school and promoting new scientific talent, including 4 doctorate of science and 42 Ph.D. theses. For over 40 years S. T. Badalov was reading lectures on geochemistry and mineralogy at the Geological Faculty of Tashkent State University.

S. T. Badalov's scientific record was recognized with a "Mineral Deposit Discovery" honorary award for discovering the Kalmakyr mineral deposit (1971), with a title of "Honorary Scientist of Uzbek SSR" (1976), the USSR State Prize for

discovering a large new mineral resource (1988). He was elected Honorary member of the Russian Mineralogical Society and Honorary chairman of the Uzbekistan Mineralogical Society, Dr. A. H. Turesebekov. made a special emphasis on Badalov's discovery of Rhenium and Osmium, determination of the age of Almalyk Copper-Molybdenum mineralization, populating the Endless Periodic Table with proto-isotopes of chemical elements and his detailed deep studies of biogeochemistry, that were the focal points of his thorough scrutiny during his last years.

Second speaker, senior research fellow of the Department of Petrology of the Institute of Geology and Geophysics of Uzbek State Geology Committee, Alisher M. Musaev, delivered a talk titled "The Role of sulphide mineralization in the formation of gold deposits of Uzbekistan, in which he described the exploration methods developed by S. T. Badalov.

Third speaker, Professor Ernst M. Spiridonov of Mineralogy Chair, Moscow State University Geological Faculty, made a report called "S. T. Badalov: remembering the scientist," in the chronological sequence of the chain of eminent scientists, with "Mentor-Student" links: from A. E. Fersman to A. S. Uklonsky and from A. S. Uklonsky to S. T. Badalov demonstrating the succession of their scientific schools in geology. He went further to mention the monographs written by S. T. Badalov. E. M. Spiridonov also underlined that in his opinion S. T. Badalov's exposure to the 2nd World War as veteran, impacted and annealed his strong personality as a scientist, empowered him with immense life energy and granted him as ability to defend his firm stand on principal matters, which he widely demonstrated as the editor-in-chief of *The Reports of Uzbekistan Department, USSR Mineralogical Society*. The level of papers published therein was not in any respect inferior to those published in the major scientific USSR magazines. He also acted as editor-in-chief when publishing the 4-volume compendium called *The Minerals of Uzbekistan*, which serves up to date as the most comprehensive study of the mineral resources of Uzbekistan.

Professor Ernst M. Spiridonov presenting one of the commemorative lectures dedicated to the 100th anniversary of Professor Stepan Badalov (chair of the meeting I. G. Pechenkin, on the right) VIMS, Moscow. September 26, 2019.

The fourth speaker, Chief Scientific Fellow of Mineralogy Chair, Moscow State University, Professor, Corresponding member of the Russian Academy of Sciences, Igor V. Pekov, made a report "Badalovite – a new mineral discovery." The mineral was discovered in 2016 by a group of scientists lead by Professor I. V. Pekov and was named to honor Professor S. T. Badalov's outstanding contribution to the mineralogical and geochemical sciences. Igor Pekov demonstrated a sample of Badalovite, which he donated to the Museum of VIMS, presented the entire history of the discovery of the new mineral in the Arsenatnaya fumarole, Second lapilli cone, Northern crevasse, The Great slope eruption of Tolbachik volcano in Kamchatka. He showed photographs and maps where the mineral was discovered and gave a detailed overview of the composition, structure and properties of this new mineral species belonging to the Alluodite Group.

A comment was made, after the official program of the lectures, by Dr. Madani Diallo (France), who defended his Ph.D. thesis in the Soviet times under the scientific guidance of Professor S. T. Badalov. M. Diallo briefed the audience on his several success stories of mineral discoveries of gold deposits in Mali and other jurisdictions of West Africa. When exploring his homeland for gold he widely relied on the wealth of knowledge obtained during his post-graduate studies in Tashkent.

The lectures were crowned with a presentation of the book called *Selected Works on Geochemistry, Mineralogy and Biogeochemistry*" published in 2015, comprising articles written by Professor S. T. Badalov during the last 20 years of his life. In conclusion, deputy Director VIMS Dr. Igor G. Pechenkin presented a short outline of the history of the VIMS Institute, and conducted an excursion for the participants over the Institute's Library and its Mineralogical Museum, featuring an extensive and unique collection of exhibits gathered by the Institute research staff during many dozens of years.

The lectures were attended by representatives of VIMS, MSU, GIN, IGEM, IMGRE, TsNIGRI, GEOHI, from Moscow, and the Institute of Geology and Geophysics at the State Geology Committee of Uzbekistan.

Igor G. Pechenkin
N. M. Fedorovsky All-Russian Institute of Mineral Resources, Moscow

OBITUARIES

Prof. Dr. Nenad Banjac (1952-2019)

Prof. Dr. Nenad Banjac, Professor of Historical Geology at the University of Belgrade, died April 23, 2019 at the age of 67 years in Belgrade. He was a retired full professor at the Faculty of Mining and Geology, University of Belgrade.

After graduating, he began his work at the Seismological Institute of the Republic of Serbia (SIS), where he remained until 1987, when he moved to the Faculty of Mining and Geology. There he built an academic career from the teaching assistant to full professor, and during that period, he was the author and co-author of more than 60 papers published in renowned journals. At the beginning of his career, as an associate for seismotectonics at SIS, he studied the geological structure of the territory of Serbia and its specifics related to earthquakes. Later, he primarily dealt with the stratigraphy or biostratigraphy of the Mesozoic. In addition, he was the author of one textbook, three chapters in monographs and a participant in several professional and scientific projects. Special mention should be made of the long-term editing of the *Geological Bibliography of Serbia*. He was the first one who introduced the *History of Geology* as new course for the students of geology. In addition to his regular job as a professor, he also performed a number of functions at the home faculty and the University of Belgrade. He retired in 2017 from the position of full professor and Head of the Geological Department of the Faculty of Mining and Geology in Belgrade.

His work was marked by many years of engagement in the work of the Serbian Geological Society (from 1988 until death). He was directly engaged in the work of the SGS Management, first as a treasurer (1988-1992), then as a secretary (1998-2002), and was elected president in 2008, a position he held until 2012. After that, he remained in the position of the past president for another four years (2012-2016). As the President of SGS, during his tenure he successfully organized (as chairman) the 15th Congress of Geologists of Serbia with international participation (Belgrade, 2010), the Ceremonial Academy on the occasion of 120 years of work of the Serbian Geological Society (Belgrade, 2011), and the 17th Congress of the Association of Geological Societies of Europe (17.MAEGS, Belgrade 2011). In his work in the Society, he was remembered as an excellent chronicler of the history of geology, both in Serbia and beyond. He translated his affinity into the work of the Section for the History of Geology, and his contribution on the monograph 125 Years of the Serbian Geological Society was especially noted. Even his role of Jovan Žujović (founder of the Society) in the performance, which was organized on the occasion of the celebration of the jubilee of the Society on February 23, 2016, will be remembered for its spontaneity and wit.

Prof. Nenad Banjac (centre) with two ex-presidents of the Society (Prof. Lj. Rundić - left, Prof. Z. Stevanović - right) at the celebration party on the occasion of the 125th anniversary of the Serbian Geological Society (2016).

Prof. Banjac was a member of INHIGEO Serbia.

His wife Milica and two children were left broken hearted due to the early passing of their husband and father. His colleagues from many countries join them in mourning his loss.

Henry "Hank" R. Frankel (October 11, 1944 – November 2, 2019)[4]

Henry Frankel, 75, died Saturday, November 2, 2019, at KU Hospital following a brief illness. He was born October 11, 1944 in Summit, NJ and lived there until his college days. He spent summers at the Jersey shore getting red as a lobster and body surfing. He taught his cousins to play softball on the beach, laughing and hitting and retrieving the softballs into the sand dunes while his uncle exclaimed, "For chrissake Hankie, stay off the dunes!" When darkness fell, he enjoyed gazing at the stars and pointing out the constellations to anyone who would listen. All his wife and daughters know about his teenage years is that he spent most of it mowing his parent's sizable lawn.

Hank earned his B.A. degree from Oberlin College, and his Ph.D. from The Ohio State University. He was a professor of philosophy at University of Missouri – Kansas City (UMKC) for 43 years, retiring in 2014. During that time, he taught and mentored countless students, many of whom became life-long friends. He found pleasure in teaching logic and ancient philosophy to those undergraduates who wanted to learn, but woe to those who thought they could sail through without effort. Always eager to help his students learn, he spent as much time as needed out of class to help a struggling student succeed. During his career, Hank published over 45 academic papers and book reviews, culminating in his life work, a four-volume book, *The Continental Drift Controversy*, published in 2012 by the University of Cambridge Press. These volumes are considered to be the definitive work on continental drift and plate tectonics in the field of earth science. Professor Frankel has been highly praised for his accessible writing style and depth of knowledge on the subject. The book was selected by the journal Choice as the Best Academic Title of 2012. Among his awards and honors are: Geological Society of America Fellow and recipient of the Society's 2014 Mary C. Rabbit award in recognition of his lifetime achievement, the first philosopher of science to win the award; the Geological Society of London's Sue Tyler Friedman award in 2013; and the 2015 Thomas Jefferson Award from the University of Missouri. During his tenure at UMKC, he received numerous grants from NSF, NEH and the University of Missouri.

Hank and his wife Paula celebrated their 50th anniversary in October 2019 with a trip to London. He was immensely proud of his two daughters and his two granddaughters. Paula and Hank enjoyed gardening together, and Hank built and worked tirelessly on their backyard water garden. They have been active patrons in the local art community for many years. In his retirement, Hank was able to get back into playing golf on a regular basis and was happy this summer when he "shot his age." He kept active professionally during this time as well, delivering lectures, writing papers, and working on a second, shorter and more accessible book on the continental drift controversy. Family and friends fondly remember him as somewhat of an "absent-minded professor," since his brilliant mind was usually on a higher plane than that of the rest of us. One of Hank's best qualities was his loyalty to his friends and family. If you were one of the lucky ones he cared for, you could always count on him to be there for you.

He is survived by his wife Paula, daughters Johanna Comes (Ben), and Nora Frankel, his granddaughters Rosemary and Margaret Comes, brother Howard Frankel, M.D. (Judy), numerous nieces, cousins, and many friends and admirers.

A celebration of Hank's life was held from 1 to 4 p.m. on Sunday, December 8th in the café at the Golden Ox Restaurant, 1600 Genessee, Kansas City, Missouri 64102.

Memorial donations may be made to a socially progressive or environmental organization of your choice, or to the KU Genetic Counseling Support Center, University of Kansas Health Center, Westwood, KS 66205. To donate online, go to kansashealthsystem.com/giving, indicating that you want your donation directed to the Genetic Counseling Support Fund.

Hank always signed his correspondence: "Joy, Hank" – so here's to you Hank, "Joy".

[4] https://www.dignitymemorial.com/obituaries/overland-park-ks/henry-hank-frankel-8911757

Martin Guntau (1933-2019)

Werner Pälchen *Manfred Störr* *Angela Kugler*
Halsbrücke *Bad Kissingen* *Kießling, Freiberg*

On July 26, 2019, Martin Guntau, the mineralogist and renowned science historian, died in Leipzig. He was born on October 12, 1933 in Gilgenau (East Prussia), graduated in 1953 in Ludwigslust Abitur and then took a mineralogical studies at the Bergakademie Freiberg with Friedrich Leutwein and Oscar Wilhelm Oelsner. He graduated in 1958 with the diploma. Subsequently, he was, until 1961, research assistant in the Department of Distance Learning at the Bergakademie. After studying philosophy and history of the natural sciences with Hermann Ley at the Humboldt University Berlin, he received, with a thesis on the terms "actualism" and "law" in the geological sciences, his Doctor of Philosophy degree.

Returning to Freiberg, from 1964 to 1976 he was curator of the Earth Sciences Collections of the Bergakademie and at the same time engaged in courses and research on the history of the natural sciences. With a thesis on the prerequisites and conditions for the emergence of geology as a scientific discipline, he again obtained the academic degree of Doctor of Science (Philosophy) at the Humboldt University in Berlin, and in the same year began his work as a lecturer in the field of history of science at the University of Rostock. From 1981 he was a full professor and from 1986 to 1989 director of the history section at the local university. With the abolition of the chair, he retired officially in 1992, but was still engaged in his field of research. Thus, the two publications on the history of geo-sciences in the GDR, published with other specialist colleagues, are largely due to his personal commitment.

Martin in the University Museum in 2003.

Martin Guntau was active in the Society for Geological Sciences (GGW) of the GDR and led from 1976 to 1983 the working group for history and philosophy of this society. He is the recipient of the GGW Abraham Gottlob Werner Honorary Needle and other domestic awards.

The basic scientific education as a geoscientist and the acquired philosophical insights in the context of further qualification enabled Martin Guntau to analyze and point out the main features of the natural sciences in their historical and social context. Especially his research on important geoscientists like Abraham Gottlob Werner and others have given him high esteem in the international professional world. From 1976 to 1984 he was Secretary-General and from 1989 to 1992 President of the International Committee on the History of Geological Sciences (INHIGEO). This was also expressed in honors and awards by international committees. He was awarded the *Silver Medal* of the Ministry of Geology of the USSR in 1984, the Geological Society of America's *History of Geology Award* in 1993, and the first foreigner in 1997 to receive the *Sue Tyler Friedman Medal* of the Geological Society of London.

„Ideen können nur nützen, wenn sie in vielen Köpfen lebendig werden."
(Alexander von Humboldt, 1799)

In Liebe und Dankbarkeit nehmen wir Abschied von unserem Vater, Schwiegervater und Großvater

Prof. Dr. sc. phil. Martin Guntau

Mineraloge und Wissenschaftshistoriker

* 12. Oktober 1933 in Gilgenau † 26. Juli 2019 in Leipzig

In stiller Trauer:
Dr. Matthias Guntau
Dorothea Seeber, geb. Guntau
Sebastian Seeber
Lea Seeber
Clara Seeber

Die Trauerfeier findet am 20. September 2019, 12.00 Uhr in der Trauerhalle in Leipzig/Gohlis (Viertelsweg 44) statt. Da seine Urne erst zu einem späteren Zeitpunkt beigesetzt wird, bitten wir von Blumengebinden abzusehen. Stattdessen können Sie sich gern an einer Baumpatenschaft beteiligen.

As a scientist on the borderland between science, history of science and philosophy, Martin Guntau leaves a large hole. His scientific legacy will continue through his extensive work.

To the memory of Martin Arthur Guntau (1933-2019): from Russia with love.

Irena G. Malakhova
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I should like to remember the very important time in my life – the epoch of Tikhomirov-Guntau.

In 1977-1990, I was a research fellow of the Laboratory for the History of Geology of the Geological Institute (the Academy of Sciences of the USSR) headed by Prof. Vladimir V. Tikhomirov (1915-1994). The coordination of our foreign relations was among my duties. There were two mainstreams of these activities: The International Commission on the History of Geological Sciences (INHIGEO), and bilateral the German Democratic Republic (GDR)-USSR symposia on the history of geology.

On the Constituent Assembly of the Committee on the History of Geological Sciences was a young geoscientist from the Mining Academy in Freiberg, Martin Guntau. Since that time, the contacts of the first INHIGEO President V. Tikhomirov and M. Guntau have been uninterrupted. - correspondence, personal meetings for various discussions on the organization of international cooperation in the history of geosciences.

After the dramatic International Geological Congress in Prague (1968) the first INHIGEO Symposium was appointed in Freiberg (GDR). From the notes of V. Tikhomirov (1970):

After the August 1968 all INHIGEO members from western countries insisted on the cancellation of the meeting in GDR and organize it in any country of the western world. It took about a half of a year to make them change their opinions.

In 1976 Professor Rejer Hooykaas (1906-1994) has superseded V. Tikhomirov at the position the INHIGEO President, and M. Guntau was elected the General Secretary of the Commission for the next eight years.

Martin Guntau & Vladimir Tikhomirov 3rd Symposium INHIGEO, Freiberg, 1970

I was a member of the Organizing Committee of the 27th Session of the International Geological Congress (IGC) in Moscow (1984). The Section 'History of Geology' and the Symposium on the history of mineralogy were included in the Congress Program. We were in close contacts with M. Guntau to work out the program of the meetings of historians of geosciences.

M. Guntau, a Professor of the University of Rostock, was a member of the GDR delegation in Moscow. His activities in the organization of the 27th IGC Session was awarded by the Silver Medal of the Congress (1984). M. Guntau was the INHIGEO President in 1989-1992 and kept close contacts with Russian colleagues.

Yury Sayadyan, Rejer Hooykaas, Vladimir Tikhomirov & Martin Guntau 11th Symposium INHIGEO on 27th IGC, Moscow, 1984.

M. Guntau played the first fiddle in organization of bilateral cooperation of German (GDR) and Soviet historians of geosciences. He was an organizer and a participant of all five meetings. Three symposia took place in GDR (Berlin, 1975; Greifswald, 1983; Holzhau-Freiberg, 1990). Two meetings were organized in Armenia (Yerevan, 1979) and Azerbaijan (Baku, 1986).

Bilateral symposia have provoked the development of close scientific contacts in the history of geosciences and gave rise to intensive researches in this field in our country.

Endre Dudich, Martin Guntau & Rejer Hooykaas in presidium - 10th Symposium INHIGEO, Budapest, August 16, 1982.

M. Guntau followed Russian publications on the history of geology, reviewed some of them, and was in correspondence with many authors.

He was the most frequent visitor in our department. Meetings with M. Guntau and his family were nice and interesting while scientific discussions had good results. The authority of our German colleague has been widening the contacts of Russian scholars looking for cooperation in different fields of the history of geosciences.

Vladimir Tikhomirov & Martin Guntau 12th Symposium INHIGEO, Edinburgh, 1985.

The Fall of the Berlin Wall (1989) and the Dissolution of the Soviet Union (1991) have marked the end of the epoch. My work in the Department for the History of Geology terminated in 1990, after 15 long years. But Vladimir V. Tikhomirov and Martin A. Guntau will be the symbols of this epoch forever.

About Martin Guntau

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In the 1990s, I first heard about Martin Guntau from Vladimir Tikhomirov and Yury Solovyov, with whom I worked in the Department for the History of Geology. We received letters from M. Guntau from time to time. Germany was going through difficult times after the unification. Many former GDR university researchers and professors, including geologists, were made to retired. In 1992, Guntau was among them. He wrote about recent changes in his life. In order to reduce the cost of living, he had to change apartment to a smaller one and moved from the downtown. His family had job difficulties too.

I first met M. Guntau in autumn 1999, during the 24th Symposium INHIGEO "A.G. Werner and his time" in Freiberg, Germany. He was very friendly with Russian delegates. My presentation was about J.G. Fischer von Waldheim, a Werner's student. Fischer was a director of the Museum of Natural History at Moscow University (1804-1832), and I was involved in the history of the museum study. Soon after my return to Moscow, I received a post package from M. Guntau with a German book about Fischer from his personal library. He wished me success in studying Fischer's legacy.

In the 2000s, life was gradually getting better, and M. Guntau start sending us occasional emails. In 2003-2004 he took an active part in the preparation of the book dedicated to the 90th anniversary of Vladimir Tikhomirov (1915-1994), *V. V. Tikhomirov – a geologist and a historian of science* (2004). Guntau wrote a large paper, translated to Russian and titled "On some goals and ways of development of the history of geology in the second half of the 20th century, and the role of V. V. Tikhomirov in the development of these problems."

24th Symposium INIGEO, Germany on the third row, right to left: Galina Anastasenko, Zoya Bessudnova, Martin Guntau & Peter Kruger. September 20, 1999, Freiberg.

Martin wrote about the main events of the past years when he congratulated us with a New Year's greeting. Sometimes wrote about his traveling to different countries, which he managed to make with his wife. I remember Martin Guntau as a delicate, goodwill and friendly person.

Translated by Ivan Vtorov

Gordon Leslie Herries Davies (1932-2019)
Honorary Senior Member (2003) [Ireland][5]

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Gordon Leslie Davies, from 1977, Gordon Leslie Herries Davies, (1932–2019) was born in Manchester on 18 January 1932, elder son of Leslie Davies, who ran the family's household furnishings business and Kathleen, née Herries, who had trained as a musician. They had married at *Chapel en le Frith* in 1931. Kathleen's mother Edith née Mounsey (1868–1954), was also influential in shaping Gordon's schoolboy interests. But these were interrupted when he was evacuated to Blackpool at the start of WW2, but he was back in Manchester for most of its duration.

*Gordon Herries Davies in the Upper Library of the Geological Society in 1972. (*Archives of Natural History*, April 2020, vo. 47, No. 1: pp. 190).*

Gordon has described his early days and how he got to Manchester University to read Geography in 1949 under the Marxist professor Walter Fitzgerald (1898–1949) but who sadly died within 10 days of Gordon's admission interview. Gordon was soon wondering why he had not chosen to read geology, clearly helped by his father's gift in 1945 of a first edition of Arthur Holmes' *Principles of Physical Geology*, but geomorphology remained his first field of interest, for which he earned his first MA (1953) on a geomorphology problem in North Wales. Soon Thomas Walter Freeman, the new man in charge of Manchester geography, who had come from Trinity College, Dublin (TCD) told him of a new opportunity there and Gordon duly arrived in Dublin in October 1954, aged 22, and discovered its wonderful library. Next, he married Kathleen Mary née Fryer in 1955 at Chester.

At Trinity Gordon served as an Assistant Lecturer in Geography (1954–57), Lecturer (1957–70), and Associate Professor (1970 until his retirement in 1989). In Trinity aside from his teaching duties he took on a pastoral role as a College Tutor for a number of years from 1959 and later as Senior Proctor where he delighted in participating in the conferring of degrees on newly graduating students in the wonderful surroundings of the College's eighteenth century Public Theatre. Given Gordon's kindness to, and influence on, the career of one of us [PNWJ], the ceremony of 20 June 1985 when Gordon read his name into the TCD records of graduates is recalled with fondness and gratitude. His significant contributions to scholarship were marked, first in 1967 by his election to Fellowship of Trinity College Dublin, and later in 1979 to membership of the Royal Irish Academy.

Professor Desmond Gillmor from TCD has described Gordon's geographical work in a fine tribute to be published in *Irish Geography*, a serial publication which he served as editor for over ten years. We, as two of his friends and disciples within the history of geology, will try to address here his achievements in this field. A first such paper was [11.] on Robert Hooke (1964) [see bibliography]. Another was [31.] on the University of Dublin (TCD) connections of two English pioneers (William Smith and John Phillips). His first book was [30.] *Earth in Decay* (1969) which he completed while on sabbatical leave in Oregon; a book which Ursula Marvin, in the USA, soon found irresistible reading, and which had earned him a Ph.D. from TCD; he had also taken a second M.A. *jure officii* from the institution by virtue of his academic standing. By late 1973, when one of us [HST] was taking a serious interest in such things, it was already out of print. This caused my first contact with Gordon. Having found an unwanted copy of one of G. H. Kinahan's books, I sent this to Gordon, asking if he could help me find a copy.

[5] Reprinted from: *Archives of Natural History*, April 2020, vo. 47, No. 1: pp. 190-201

Gordon's reply of thanks was for "a book that I have been looking for, for a very long time but I have just never seen a copy on the market." It was soon followed by a copy of *Earth in Decay* which started a life-long friendship between two enthusiastic book-hounds. *Earth in Decay* owed its origins to Gordon's long-term interest and researches early in his career on landscapes and geomorphology; to this he added a deeper contextural understanding and analysis through careful historical analysis. Early in his career at TCD he discovered the valuable library holdings of the Department of Geology, and he later told PNWJ who is now its custodian, that it provided him a gateway to the research and lives of the geological pioneers, amongst others Richard Griffith and Beete Jukes whose significance Gordon did much to bring to modern attention. The publication of *Earth in Decay* marks a transition in Gordon's research from geographical/geomorphological subjects to the history of earth sciences and geological cartography. This transition is also reflected in the suite of book reviews that Gordon's produced during his career [see bibliography].

In 1977, Gordon changed his surname to 'Herries [his mother's maiden name] Davies' in an attempt to avoid confusion with another [Kenneth] Gordon Davies (1923–1994) who had then been appointed professor of modern history at TCD. On 19 November 1980, Gordon gave the prestigious Ramsbottom Lecture to the Society for the History of Natural History, with an introductory talk by Jean Archer, his future partner, on "Griffith's geological map of Ireland." Gordon spoke on "The Mapping of Natural Phenomena in 19th Century Ireland" (see *SHNH Newsletter*, 19, 4-5, 1981). This was a precursor to his next book; the beautifully written and illustrated [68.] *Sheets of Many Colours* (1983), finely produced by the Royal Dublin Society, which told the story of the mapping of Ireland's rocks.

In 1989 Gordon took early retirement from TCD, and he and Jean soon moved to Ballinaclough House, near Nenagh, Co. Tipperary. In a letter to the first of us [HST] in November 1991, Gordon wrote how " 'The Dictionary of Irish Biography' [now online] is taking up a great deal of my time. It is supposed to be just a part-time activity - just one day per week really - but it is very difficult to keep a part-time job under control. But what I really took early retirement to do was to write. I still get some of my own writing done, but I am not spending as much time in that direction as I would wish …"

But how successfully he continued is revealed in his list of publications. The next *magnum opus*, his third book, appeared in 1995, *North from the Hook* [Peninsula, Co. Wexford] [102.]. This records the complex history of the Geological Survey of Ireland and was published by the Survey as a major contribution to its 1995 sesquicentennial celebrations. It again drew favourable reviews. His last book was his invited, and sadly constrained, bicentenary history of the Geological Society of London, [131.] *Whatever is Under the Earth*, 2007, 356 pages. It was commissioned to be written 'in a more modern mould' and from budgetary demands had to dispense with detailed references to his sources. We will never forget Gordon's distinguished appearance at the September 2007 bicentenary conference when, with his shock of long, now white, hair, he "cut a strange figure among the delegates", like - in Dawn Riddle's words, "a cross between William Buckland and the Wombles Great Uncle Bulgaria." Gordon wrote this in his own inimitable style, with "page after page enlivening what could so easily be a worthy but heavy tome", in a highly personal account. Finally, in 2009, he and Jean Archer settled near Lochmaddy, in the Scottish Isle of North Uist. This island was the subject of his first ever paper [1.] and thus was an escape to his roots providing a marked charge from the dins of Dublin or Nenagh. Here, on 22 February, Gordon died in his sleep.

Gordon was a long-time member of INHIGEO, becoming an Honorary Senior Member in 2003. He had been honoured with the Friedman Medal of the Geological Society of London in 1996 (see *Geoscientist*, vol. 6 (5), p. 25, Sept/Oct 1996); the History of Geology Award of the Geological Society of America in 1997 (see *GSA Today*, pp. 26-28, March 1997) and the Founder's Medal of the Society for the History of Natural History in 2000 (see *SHNH Newsletter*, 67, p. 2, May 2000).

Gordon will be sorely missed. He was kind, helpful and encouraging to all who approached him for help. He is survived by his long-time companion Jean, his wife Mary, their two sons Kelvin and Lyell, Kelvin's partner Jane, and brother Raymond.

Gordon Leslie Herries Davies Bibliography

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In the memory of Andrey Vitalyevich Lapo (1937-2019)

Andrey Lapo in VSEGEI, St. Petersburg, Dec. 30, 2015. Photo Leonid Kolbantsev.

Dr. Andrey Vitalyevich Lapo passed away on March 11, 2019 in Saint Petersburg, Russia. He was a geoscientist, a paleobotanist, a historian of science, an INHIGEO member (2002), Honorary Member of the Paleontological Society at the Russian Academy of Sciences (1998), and an organizer and the head of the Russian group in the European Association for the Conservation of the Geological Heritage (ProGEO) (1996-2007).

Andrey Lapo was born on July 7, 1937 in Leningrad (St. Petersburg), USSR. He graduated from the Leningrad Mining Institute in 1959 with a degree Geology and Exploration of Mineral Deposits. He started his career in the CarbonPetrographic Laboratory of the Institute of Geology of the Arctic and Antarctic (NIIGA).

Since 1962 most of his professional activity took place in St. Petersburg, at the A. P. Karpinsky Russian Geological Research Institute (VSEGEI). He had wide scientific interests, from the special study of the coal geology and ecology to the general natural history. His fields of study evolved from carbon petrography, which was the subject of his dissertation (1973), to the study of the chemical composition of micro component parts and the initial substances of coal, through the study of the geological and biological correlations in development of the Earth. This made sense of deep understanding and popularization of Vladimir Vernadsky's (1863-1945) ideas, and further solutions of geological heritage problems, geo-conservation and to the history of geology.

His list of publications with over 200 titles contains more than 50 works on the history of geology. Lapo highlighted Vernadsky's works in Russia and abroad. He made a deep and diverse analysis of the creative legacy of Vernadsky, the biosphere theory and the role of life in the geological processes, the contribution to the biogeochemistry, paleobotany and other geosciences. His book *Traces of Bygone Biospheres* (1979, 1987 - 2nd edition) describes the biosphere doctrine on the modern level, with new data about global functions of living matter and the principles of ecosystems sustainable development. He paid attention to the scientific discoveries of the 1950-1970s, such as ecosystems ocean's deep rift zones. The book's translation to English (1982) has invited world attention to the ideas of Vernadsky and to help understanding of his biosphere concept, as a theoretical basis for the perspective of sustainable development of society. Lapo was invited to lecture to the universities of Poland, Germany, and the USA. In an anthology book *V. I. Vernadsky: pro et contra* (2013) he brought together for the first time the most significant papers about Vernadsky published in 1898-1998. He also wrote an introduction to it and made comments.

Lapo was an active member since the establishment (1993) of the European Association for the Conservation of the Geological Heritage (ProGEO). He initiated the Russian group of ProGEO, which united different specializations of geologists mostly from VSEGEI.

He was also a member of INHIGEO, and over the past 15 years his main research subject was the history of the Geological Committee of Russia (Geolkom, 1882-1930) and its successor VSEGEI. He published papers about its geologists, their scientific heritage and life philosophy. The important feature of his works was deep respect and love to the geologists, as well as one of the most important tasks – to pay tribute to the scientists who passed away.

Lapo's long term scientific research was recognized and he was awarded with the Silver medal from the Russian Academy of Natural Sciences organization (2001), and the badge "Order of V. I. Vernadsky" (2013) from the Vernadsky non-governmental ecological fund.

Lapo's wide scientific interests, friendliness, kindness, outgoingness, and the ability to gratified by colleague's success have always distinguished him. Moreover, he was self-disciplined, self-rigorous, based on principles, and uncompromising both in scientific and in ethical evaluations. He was a goal-oriented and an enthusiastic person. He knew and loved literature, poetry and painting. His colleagues and students left a mark in history and a grateful memory of him. Main works of Andrey Lapo on the history of geology:

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L. R. Kolbantsev, I. G. Malakhova, I. P. Vtorov, M. S. Vdovets, G. A. Belenitskaya, M. V. Oshurkova & E. O. Kovalevskaya
Translated by Ivan Vtorov

In memory of Victor Ludwigovich Masaitis (1927-2019)

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Viktor L. Masaitis, 2011.

Prof. Viktor Ludwigovich Masaitis - an outstanding Soviet and Russian geologist, a world-famous scientist, initiator of research of impact structures in the former Soviet Union (USSR), discoverer of the giant deposits of impact diamonds in the Popigai impact structure, passed away on July 21, 2019. He contributed invaluably to study of fundamental problems of regional geology, magmatism and diamond-bearing of stable platforms; geology, petrology, mineralogy and economics of impact structures.

Victor L. Masaitis was born on July 21, 1927 in Leningrad. In 1950, he graduated from the Leningrad Mining Institute and entered into VSEGEI - now the A. P. Karpinsky Russian Geological Research Institute in St. Petersburg, with which all his scientific and practical activities (more than 70 years) are connected. He spent many field seasons in remote, unexplored areas of Eastern Siberia, for which often there were not even topographic maps; these were basins of Lena, Lower Tunguska, Vilyui, and Olenek rivers, and others. He participated in the compilation of the first forecast diamond map of the Siberian Platform (under the direction of I. I. Krasnov, 1952), where possible areas of kimberlite location were outlined. These works, among others, became the basis for the subsequent discovery of kimberlites and diamond deposits in Western Yakutia.

Until 1970, Victor Masaitis was involved mainly in complex investigations of magmatic rocks in East Siberia. These investigations proved Victor Masaitis as a prominent expert in geology, tectonics, and magmatic associations of the Siberian platform and surrounding mobile belts. The results of study of igneous rocks in Eastern Siberia results were compiled by Victor Masaitis in his doctoral dissertation, *Pre-Permian basic magmatism in the Siberian Platform* (1970). Since 1971, he headed the Petrology Department of VSEGEI, which was the main authority in magmatic petrology in USSR. For more than 30 years, V. Masaitis led research efforts on petrology and formation analysis of igneous, metamorphic and impact rocks.

At the same time, V. L. Masaitis has discovered a new field of research for Soviet geologists - geology, petrology and mineral resources of impact structures. He paid attention to the unusual Popigai circular structure, which was considered before as a volcanic caldera. He suggested that it could have arisen due to a giant asteroid fall to the earth and the subsequent explosion. The investigation of the Popigai structure started in 1970. As a result, shock-metamorphosed rocks, impactites, and other shock effects were discovered, which fully confirmed the cosmogenic hypothesis. In the following years, V. Masaitis substantiated the cosmogenic origin of the Kara, Kaluga, Kursk, Mishina Gora, Kamensk, Boltysh, Ilyintsy, and Puchezh-Katunki structures in the territory of the USSR. This became the beginning of a new scientific branch - geology of astroblemes.

V. Masaitis (left) with fieldwork staff. Popigai Crater, 1972.

Due to studies of lithologies from the Popigai structure, impact diamonds that arose during the shock transformation of graphite of target rocks were discovered for the first time in world practice. Unique resources of industrial impact diamonds were established, and patterns of their distribution were determined.

V. L. Masaitis together with a special research group on impact rocks, founded in 1974 within the Petrology Department of VSEGEI, studied almost all impact structures in Russia, Ukraine, and Kazakhstan. The results of these works are published in numerous papers, the most significant of which are: "Popigai meteorite crater" (1975), "Geology of astroblemes" (1980), "Diamond-bearing impactites of the Popigai astrobleme" (1988), "Impact craters on the MZ-CZ boundary" (1990), "Deep drilling in the Puchezh-Katunski impact structure" (1999). In total, V. L. Masaitis has published more than 150 works devoted to the geology and petrology of impact structures, classification and nomenclature of impact rocks, modeling of impact crater formation, astroblem mineralization, impact diamonds, *etc*. As a result of many years of research, a unique collection of impact rocks including specimens from more than 30 craters, was collected in VSEGEI.

V. L. Masaitis was awarded the Barringer Medal of the International Meteorite Society in 1991. During geological excursions, he got acquainted with many impact craters all over the world. With his direct participation, impact diamonds were also found in a number of craters (Sudbury, Ris, Lappajärvi). All this allowed him to substantiate and develop one of the new directions in geology - the impact structures minerageny.

In total, V. L. Masaitis is the author and co-author of more than two dozen scientific monographs and more than 350 articles, some of which are published in English, German, Chinese and Korean. He paid much attention to the popularization of geological knowledge: he gave lectures at universities and other scientific institutions in Russia, Europe and the USA, made presentations at special seminars and conferences, participated in the creation of a scientific documentary film about the geological traces of space catastrophes. V. L. Masaitis is an Honored Scientist of the Russian Federation, Honorary Member of the Russian Mineralogical and Russian Geological Societies, member of the International Meteorite Society, he has been awarded numerous government and departmental awards.

V. L. Masaitis was not engaged in special studies in the field of the history of geology, but he possessed a vast experience in practical and theoretical geology and petrology, and he was a participant in the events that led to the largest geological discoveries in the USSR in the 20th century. Despite the heavy workload of scientific research, he found time to write two fascinating books on the history of the discovery of diamonds in Eastern Siberia. In these books, through the eyes of an eyewitness and a participant, the characters are represented, the complex atmosphere of those years (1950s), the events that led to the discovery of Yakut diamonds (V. L. Masaitis. *Where are the diamonds there?* 2004), and the dramatic, fascinating epic of the study of the Popigai structure, evidence of its impact origin, discovery and study of impact diamond deposits (V. Masaitis. *There are diamonds.* 2016).

V. Masaitis (in center) in field work, Popigai Crater. 1970s.

Victor Ludwigovich Masaitis was an example of a true geologist and a man, an intellectual and a hard worker who devoted his life to the study of our planet. From personal communications with him, each of us found understanding and wisdom, felt support and got solutions of many difficult problems. The memory of Victor will forever be preserved by us.

Works of Victor Masaitis on the history of geology

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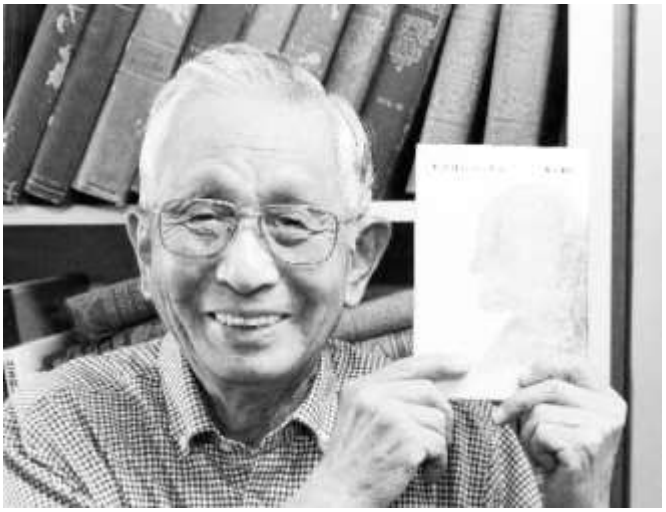
Masaitis V. L. 2016. *There are diamonds.* - St. Petersburg: VSEGEI Publishing House. 2016 .-- 382 p.Там, где алмазы. - Санкт-Петербург: Изд-во ВСЕГЕИ, - 382 с.

In memory of Professor KANENORI SUWA 諏訪兼位 (1928-2020)

Michiya Inomata and Michiko Yajima



Professor Kanenori Suwa in 2018.

On 15th March 2020, we abruptly lost honorary member of INHIGEO, Professor Kanenori Suwa. His Tanka (a short Japanese poem of 31 syllables) appeared in the newspaper *Asahi Shimbun* on 22nd March. It reconfirmed his passion for this type of poetry. His wife, Yoshiko Suwa, gave us the sad news as follows: "My husband has been in no trouble till March 12. Since then, he seemed to have a strong abdominal pain. He was brought to the Japanese Red Cross Hospital on the morning of 13th March. According to the doctor in-charge, he seemed to have a trouble in his large intestine (but not cancer). My husband watched Sumo wrestling on TV in the evening of 14th March. However, at the midnight of the day, his blood pressure lowered, and he finally passed away just past 3:00 A.M. on 15th March. After his death, his corpse was submitted to an autopsy, and found that the cause of his death was the necrosis of his sigmoid colon." From hearing that, we knew that he had passed away very suddenly.

During the INHIGEO Symposium in Japan on August 4, 2011, before the statue of WAKAYAMA BOKUSUI (1885-1928), a ,famous poet of Tanka, at Horaiji Natural History Museum with David Branagan(middle) and late Yasumoto Suzuki (right).

Kanenori Suwa was born at Kagoshima (southern Japan) in 1928. In 1951 he graduated from the Geological Institute, Faculty of Science, the University of Tokyo and worked at Faculty of Science, Nagoya University. He worked at Nagoya University till 1992 and then went to Nihon Fukusi University. From 1999 to 2003 he was the president of that University.

Dr. Suwa's major area of study and research was petrology, and he received his Ph.D. degree in science at Nagoya University on the 20th of February 1962. The title of his dissertation is *Petrological and geological studies on the Ryoke metamorphic belt*. Although his primary area was mainly in the fields of petrology and mineralogy, he was active in wide range of fields in geology, and he published many important papers in academic journals. Moreover, he was one of precursors of overseas researches in Japan. In 1962, a research group of African countries was formed in Nagoya University. He participated in it, from 1962, and he continued his research in the geology of Africa and the Great Rift Valley. He made every effort to establish the Japan Association of African Studies in 1964, and he once served as president of that group.

During his busy days of research, he frequently posted his Tanka, and in 1992 and 2009, his works of Tanka were twice awarded to the prize from *Asahi Shimbun.*

Dr. Suwa has been the member of INHIGEO since 1990. When the International Geological Congress（IGC）was held at Kyoto in Japan in 1992, he served as the member organizing committee. JAHIGEO (Japanese Commission of History of Geology) was established in 1994 and he was one of 28 founding members. He was Vice-President (Asia) for (INHIGEO from 2000-2004. In 2011 the INHIGEO Symposium was held in Japan just after the large earthquake and we all wondered and worried if it was all right, or not, to hold international symposium at that time. Suwa gave us good suggestions and encouraged us and the meeting was held without incident.

Dr. Suwa wrote many books on geology, did many paintings, and wrote Tanka. For a brief review of his book: *Ganseki wa doushite dekitaka* [*How rocks were investigated*] (Tokyo, Iwanami-shoten, 2018), please see p. 120 of the *INHIGEO Annual Record* no. 51.

For more details of Dr. Suwa's work and life, please see: Michiko Yajima and Toshihiro Yamada, 2012: An Interview with Professor Kanenori Suwa: An Energetic Japanese INHIGEO Senior Member: *JAHIGEO Newsletter* No. 14: pp.2-8 https://www.academia.edu/12865375/Jahigeo_Newsletter_14_2012.

ARTICLES

THE USE OF TERM '*GEOLOGY*' REVISITED

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In the history of Earth Sciences there has been a small controversy regarding either authorship or priority about the term of *geology* among a number of authors for nearly five hundred years, where imprecision as a concept within the science was prevailing. Thus, it could be said that *geology* is a term with multiple anniversaries (Table I).

The main idea that is to be examined, on the basis of primary sources, is that conceptual vagueness of this word. This lack of precision is evident in both the use and meaning given to the term by several authors involved in this discussion from the mid-fourteenth century to the first decades of nineteenth century. From secondary sources, and checking this information against the original reference texts, some errors in the history of geology concerning the use of this term will also be revealed. These misinterpretations have neither been identified nor recognized as such because primary sources have never been used. They have not been consequently analyzed or discussed, on the contrary, they have become part of the doctrinal body of the history of Earth Sciences as if they were truths.

DATE	AUTHOR	WORK	ANNIVERSARY
1344/1473	Bury	*Philobiblon*	676/547
1603	Aldrovandi	The will	417
1657	Escholt	*Geologia Norvegica*	363
1661	Lovell	*Πανορυκτολογια*	359
1687	Sessa	*Geologia*	333
1690	Warren	*Geologia*	330
1700	Clüver	*Geologia*	320
1735	Martin	*Philosophical Grammar*	285
1736	Bailey	*Dictionarium*	284
1751	Diderot & d'Alembert	*Encyclopédie*	269
1755	Johnson	*Dictionary*	265
1760	Arduino	*Nuova raccolta*	260
1778	De Luc	*Lettres physiques et morales*	242
1779	Saussure	*Voyage dans les Alpes*	241
1795	Hutton	*Theory of the Earth*	225
1803	Faujas de Saint-Fond	*Essai de géologie*	217
1811	Breislak	*Introduzione alla geologia*	209
1815	Phillips	*Outlines of Mineralogy*	205
1820	Buckland	*Vindiciae Geologiae*	200
1830	Lyell	*Principles of Geology*	190

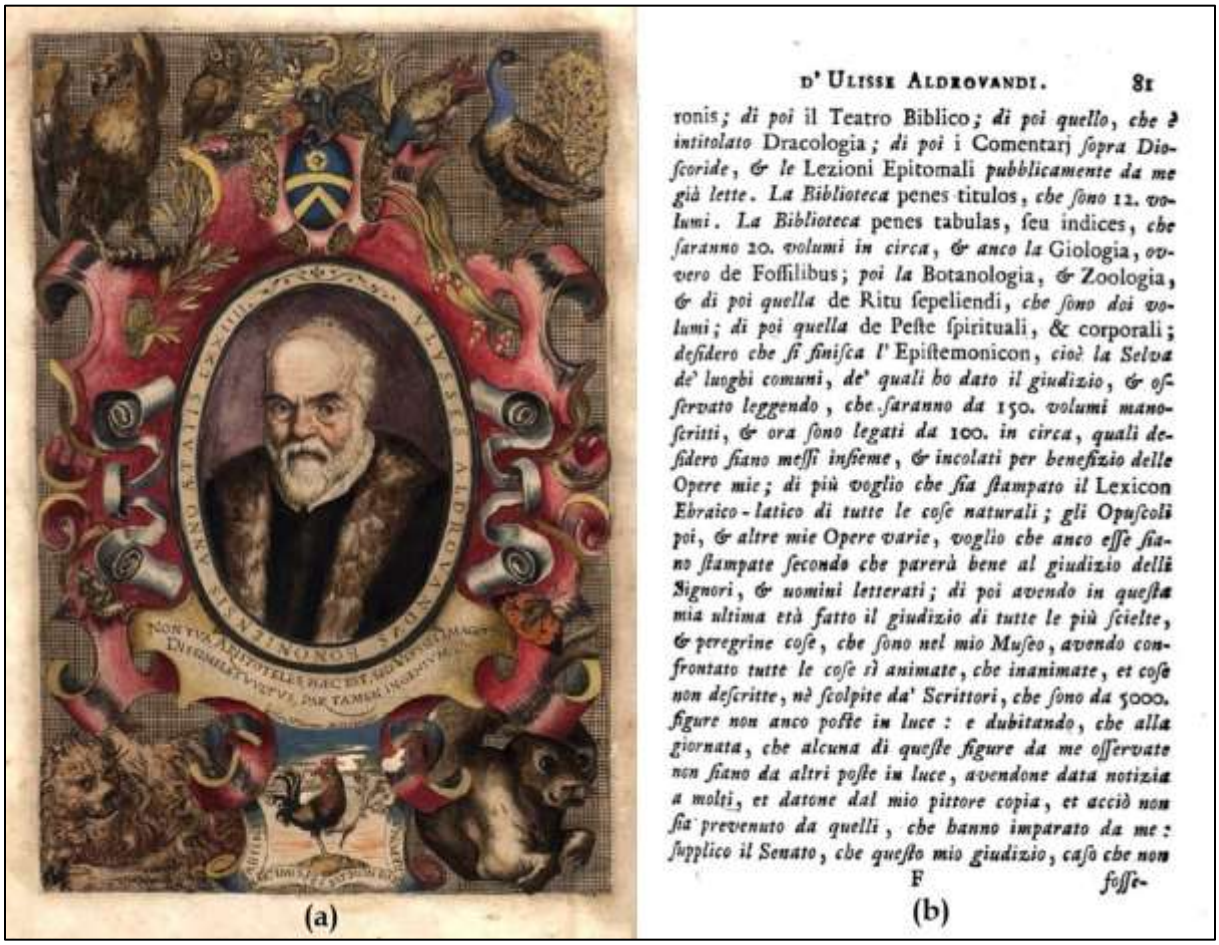
Table I. The term geology in several authors between 14th/15th-19th centuries (anniversaries for the year 2020).

The term '*geology*' from 14th century to 19th century.

The thinker who has been conceded the most importance has been the Bolognese physician and naturalist Ulisse Aldrovandi (Fig. 1); he has been pointed out as the first naturalist who used the term *geology* in its modern (?) sense (Adams, 1932, 1933, 1938, p. 165-168; Dean, 1979; Thuillier, 1985; Vai, 2003; Vai & Cavazza, 2006). In his will, dated in 1603 and published 171 years later by Giacomo Fantuzzi (1774, p. 67-85), it can been read the expression "Giologia,[6] *ovvero* De Fossilibus" (Fantuzzi, 1774, p. 81), that is, "Geology, or on what is dug out of the earth" (from Latin, *fossilis*, dug out, from *fossus*, past participle of *fodere*, to dig out). This is the only 'definition' of this term given by Aldrovandi and does not appear on a later compilation of his extensive work concerning the fossils (Ambrosinus, 1648). Aldrovandi's idea about *geology*, although in connection with earth's materials, however, cannot be actually considered in a *modern sense*, since it is closer to

[6] It is transcribed sometimes nowadays as *geologia*.

Oryctognosy,[7] whom meaning is precisely '*knowledge on what is dug out of the earth*' (from Greek, ορυκτος, dug out, and γνοσις, knowledge). Later, from the following century, this later term would be nearly permanently displaced by that of *Mineralogy*, much more concrete and, on the other hand, also in common use, although some authors continued using it.



(a)

D' ULISSE ALDROVANDI. 81

ronis; di poi il Teatro Biblico; di poi quello, che è intitolato Dracologia; di poi i Comentarj ſopra Dioſcoride, & le Lezioni Epitomali pubblicamente da me già lette. La Biblioteca penes titulos, che ſono 12. volumi. La Biblioteca penes tabulas, ſeu indices, che ſaranno 20. volumi in circa, & anco la Giologia, ovvero de Foſſilibus; poi la Botanologia, & Zoologia, & di poi quella de Ritu ſepeliendi, che ſono doi volumi; di poi quella de Peſte ſpirituali, & corporali; deſidero che ſi finiſca l' Epiſtemonicon, cioè la Selva de' luoghi comuni, de' quali ho dato il giudizio, & oſſervato leggendo, che ſaranno da 150. volumi manoſcritti, & ora ſono legati da 100. in circa, quali deſidero ſiano meſſi inſieme, & incolati per benefizio delle Opere mie; di più voglio che ſia ſtampato il Lexicon Ebraico-latico di tutte le coſe naturali; gli Opuſcoli poi, & altre mie Opere varie, voglio che anco eſſe ſiano ſtampate ſecondo che parerà bene al giudizio delli Signori, & uomini letterati; di poi avendo in queſta mia ultima età fatto il giudizio di tutte le più ſcielte, & peregrine coſe, che ſono nel mio Muſeo, avendo confrontato tutte le coſe sì animate, che inanimate, et coſe non deſcritte, nè ſcolpite da' Scrittori, che ſono da 5000. figure non anco poſte in luce: e dubitando, che alla giornata, che alcuna di queſte figure da me oſſervate non ſiano da altri poſte in luce, avendone data notizia a molti, et datone dal mio pittore copia, et acciò non ſia prevenuto da quelli, che hanno imparato da me: ſupplico il Senato, che queſto mio giudizio, caſò che non

F

foſſe-

(b)

Fig. 1. (a) Portrait of Ulisse Aldrovandi, 1596; unknown painter (in Aldrovandi, 1599, frontispiece, p. [8]). (b) Text of Aldrovandi's will wherein the word 'giologia' can be read (in Fantuzzi, 1774, p. 81, line 6). [Public domain].

There is, however, an earlier reference to the Aldrovandi's will: One hundred and thirty years before, in 1473, *Philobiblon*, or 'The Love of Books'[8] (from Greek φίλος, loving, and βιβλίον, book) was published in Latin. It was a posthumous work of Richard de Bury, a British Benedictine monk, writer and bibliophile, bishop of Durham (Fig. 2), whom manuscript dated from 1344.

At the end of chapter 11, Bury uses the word *geologiam* (accusative singular case for *geologia*) although he did not define it as a concept:

> "Ex quibus liquido satis constat, quod sicut leges nec artes sunt nec scientiae, sic nec libri legum libri scientiarum vel artium proprie dici possunt; nec est haec facultas inter scientias recenscenda, quam licet *geologiam*[9] appropriato vocablo nominare." (Bury, 1473, p. 90; my emphasis).

[7] Sometimes other analogous expressions are also found, such as *Oryctology* (λογος, treatise, discourse), and *Oryctography* (γράφως, description, writing).

[8] The most correct translation of *Philobiblon* should be 'The Love *to* [or *for*] the Books', although it has prevailed that aforementioned.

[9] In some manuscripts (as an editor's margin note) is written *geologicam*, even *genealogiam*.

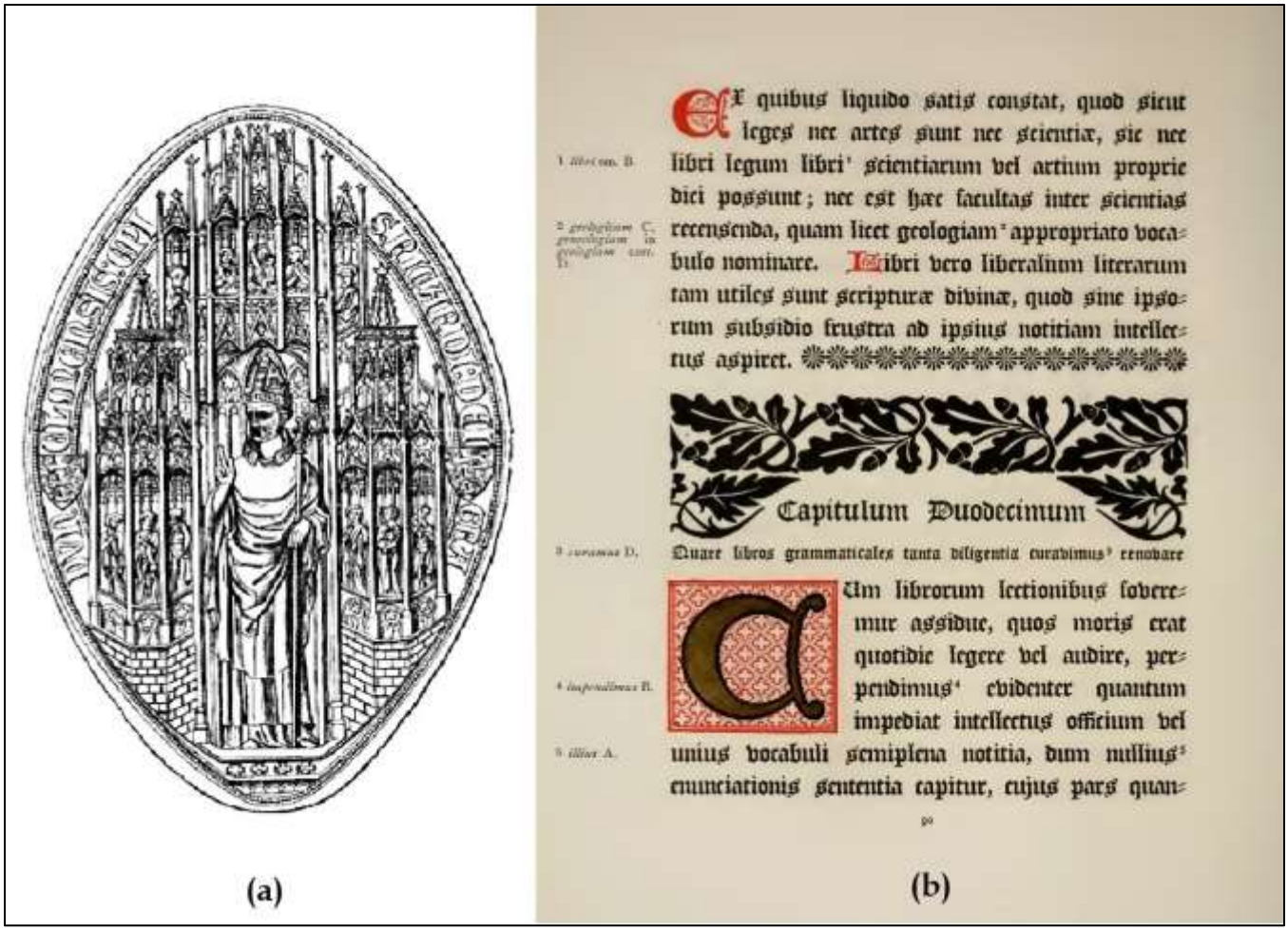


Figure 2. (a) Seal of Richard de Bury (in Thomas, 1888, frontispiece). (b) Text of Philobiblon wherein the word geologiam can be read (Bury, 1473, ed. 1889, p. 90, line 5). [Public domain].

A bilingual (Latin-English) edition of the Bury's work with a translation by Ernest C. Thomas (Trinity College, Oxford) was published in 1888. This is the most spread version, and it is considered as the first true text of the *Philobiblon*; the aforementioned paragraph is translated as follows:

> "From which it is seen clearly enough, that as laws are neither arts nor sciences, so books of law cannot properly be called books of art or science. Nor is this faculty which we may call by a special term *geologia,* or the *earthly* science, to be properly numbered among the sciences." (Thomas, 1888, p. 219; translation of the above Latin text, p. 102; original emphasis).

As it can be seen by comparing this translation with the original Latin version, the emphasized text (or the *earthly* science), as it appears on the English version, does not exist in Bury's work. It is, therefore, an interspersed expression, or an interpretation added freely by the translator, and as the saying goes, this can be expressed once again as *Traduttore, traditore!* (*Translator, traitor!*). Thus, just as the excellent historian of geology, Canadian geologist Frank Dawson Adams does, a possible relationship of geology to 'earthly things', as opposed to theology, or study of 'divine things', would be laid down, a such relationship that does not appear actually on Bury's work, in spite of the fact that there could have been during the Middle Age. In this last case, nobody knows *for sure* who has got the authorship of this word with that sense. It has been suggested that it *may* have been coined by Venerable Bede, an Anglo-Saxon theologian and historian in the 8th century, to distinguish earthly matters from godly matters (Allaby, 2020), but I have not found this coining, or something like that, in any of the Bede's complete works (Migne, 1861-1862). Furthermore, in an English dictionary of medieval Latin (Ashdowm *et al*., 2018), Bury is precisely quoted, but not Bede, in a reference to geology as the study of earthly things, a reference based undoubtedly on Thomas's translation discussed above.

Still, and to go back to translation of Bury's text, there is another misinterpretation, in this cases again by Adams: namely the inclusion of the Laws within the geology *on Benedictine monk's side* (Adams, 1938, p. 166), whereas Bury actually not only considered them independent disciplines, but also did not include them among the sciences. Many other historians of geology have *accepted* those Adams' interpretations (probably without ever resorting to the original Latin text) and have been subsequently spread to the present as if they were true.

The Latin term *geologia* was used by some authors throughout the seventeenth century, although only in the title pages of their works, without defining its meaning. Mickel Pedersøn Escholt, v. g., Danish Protestant priest, published *Geologia Norvegica*, 1657, a work with physical, historical and theological grounds on the causes and meaning of earthquakes, "…a brief instructive remembrancer, concerning that very great and spacious earthquake, which happened almost quite through the South parts of Norway: upon the 24th day of April, in the Year 1657.", such as one can read in the title of his book (Escholt, 1657). Also, the British Erasmus Warren used this term in his work *Geologia, or A discourse concerning the Earth before the Deluge* (Warren, 1690), a harsh criticism about *Telluris Theoria Sacra* (1680) of Thomas Burnet, where Biblical Flood was the most preponderant aspect of his theology. Likewise, another book should be kept within this same context, *Geologia sive philosophemata of Genesi ac structura globi terreni* (1700), of the German mathematician, astronomer and philosopher Detlev Clüver. On the other hand, Fabrizio Sessa, professor of Sacred Theology in Naples, published a work also entitled *Geologia* (1687), wherein he cites this term throughout the text, but it is rather a treatise in which the author tries to prove that the influence ascribed to the stars by astrologers really comes from the Earth itself.

According to Adams (1938, p. 165), the term appears for the first time on an English language work in a book of the British naturalist Robert Lovell; likewise, Fenton & Fenton (1945, p. 54) also refer to this same author, although there is no mention about him, when they hold that the term "…had been introduced in 1661 by a British author…", but it is not true according to what has been mentioned so far. Lovell uses this word, indeed, but in Latin, in his treatise about 'everything what is dug out the earth', *Πανορυκτολογια, sive Pammineralogicon, or An Universal History of Minerals*, for commencing the study about *earths*: "GEOLOGIA. Of Earths", a subgroup of *fossil bodies* within the minerals (Lovell, 1661, p. 1), but he also does not provide a more explicit definition in this regard, and where Aldrovandi is one of the most cited mineralogists throughout the text.

We must await, however, until 1735 for *Geology* to be defined as the "General Doctrine of the Globe" by Benjamin Martin, an English lexicographer and manufacturer of optical instruments, in *The Philosophical Grammar*; this is a book specially interesting, as it is designed through answers to questions asked, wherein, in addition to establishing the etymology of the term (from Greek, γῆ, earth, and λογος, discourse), its different divisions or branches are also defined, as well as the different parts of the globe which make up the object of study (Martin, 1735, Part IV). This etymology would be printed in some dictionaries in the following years, for example, *Dictionarium Britannicum* by Nathan Bailey, wherein *geology* is defined as the "Treatise or Description of the Earth" (Bailey, 1736, Preface), and also by Samuel Johnson, in *A Dictionary of the English Language*, being *geology* the "Doctrine of the earth; the knowledge of the state and nature of the earth." (Johnson, 1755).

Giovanni Arduino, an Italian naturalist, 1760, published a 6-volume work entitled *Nuova raccolta d'opuscoli scientifici e filologici*; the sixth volume contains two letters addressed to his fellow countryman Antonio Vallisnieri, physician and naturalist, concerning '*osservazioni naturali*' (natural observations). The aforementioned idea of Aldrovandi about geology was recovered in the first letter, where he indicates referring to Vallisnieri:

> "...che mi anima alla continuazione delle Fisiche osservazioni, attinenti alla Geologìa, ed alla Mineralogìa, studio che da gran tempo è la mia passione dominante..., ricerca e contemplazione delle produzioni del Regno Fossile."[10] (Arduino, 1760, pp. XCIX-C).

This term, however, does not find in a later essay where Arduino increases his studies which are, in a modern sense, clearly geological in kind, and where some related words as *geologists* (*Geologi*) and *geological* (*Geologiche*) appear only once (Arduino, 1774, p. 232, 256). It is essential to remember that Arduino has been regarded as a true geologist, and he is usually called 'the Father of Italian Geology'.

Some authors (among many others, Geikie, 1897, p. 186; Zittle, 1899/1901, p. 77, 106/p. 47, 76; Kober, 1925, p. 4; Eyles, 1969, p. 160; Dean, 1979; Oldroyd, 1996, p. 323, note 2 from chap. 3; Rudwick, 1997, p. 4; 2002, p. 51; Heringman, 2009, p. 253; Sissingh, 2012, p. 53) have considered the term *geology* in its modern sense as due to some naturalists in French language, mainly Jean-André de Luc, geologist and meteorologist, and also Horace-Bénédict de Saussure, explorer and geologist. The former, indeed, writes the following in his *Lettres physiques et morales*:

[10] ...that he encourages me to continue the Physical observations, related to Geology, and Mineralogy, a study that has been my prevailing passion for a long time..., the research and observation of the Fossil Kingdom products (my translation).

> "Je n'entends ici par *Cosmologie* que la connoissance de la *Terre*, & non celle de *l'Univers*. Dans ce sens, *Geologie* eût été le mot propre; mais je n'ose m'en servir parce qu'il n'est pas usité."[11] (De Luc, 1778, Préface servant d'Introduction, pp. VII-VIII, note a ; original stress and orthography).

Authorship of that term in a modern sense, that many authors have conceded to de Luc, has been described by Lewis (2009, p. 120) as a *myth* originated from the 1831 English translation of de Luc's *Lettres sur l'histoire physique de la Terre*, wherein the translator, Reverend Henry de la Fite, asserts that the word *geology* was invented by this geologist (de Luc, 1831, p. 1, note 1), what is also not true, as in the aforementioned case of Lovell.

Saussure, for his part, in *Voyage dans les Alpes*, wrote:

> "La science que rassemble les faits, qui seuls peuvent servir de base à la Théorie de la Terre ou à la *Géologie*, c'est la Géographie physique, ou la description de notre Globe."[12] (Saussure, 1779, Discours Préliminaire, p. II ; original stress).

This appreciation of Saussure follows undoubtedly the assessment in those years, especially in France, about Physical Geography (for example, Desmarest, 1757, p. 626) because the latter was regarded a more notable or relevant discipline as a description of our Globe. Furthermore, in those same years and until the first decades of the 19th century, in continental Europe, especially in Germany and France, the concept of geology would conflict with that of *Geognosy*. This was due to the great influence exerted by Abraham Gottlob Werner, who directed at that time the Bergakademie at Freiberg. The objectives and methodology of Geognosy were known and were based on interrogating nature according to the Wernerian Neptunist principles, but it was not entirely clear the scope and extent of the problems to be studied, beyond mining activities. While geology was considered a systematic and speculative discussion of the Earth, Geognosy was the knowledge of the Globe, but linked especially to petrology, lithological stratigraphy, and mineralogical geography, as a complement to Oryctognosy.

But even so, the term *Géologie* had been previously used in French language by Denis Diderot and Jean Le Rond d'Alembert in the first volume of the *Encyclopédie*, being the '*Science des Continens*' (Science of the Continents), along with other branches within *Cosmologie* or '*Science de l'Univers*' (Science of the Universe) (Diderot & d'Alembert, 1751, p. L).

It is interesting to note here that two important French authors for developing geology as a science in the 18th century, Henry Gautier and Georges-Louis Leclerc, Comte de Buffon, do not cite this term in any of their works on this subject (Gautier, 1723; Buffon, 1749, 1778). This term also was not cited by the Prussian thinker Immanuel Kant, whose geological fundamentals and his theory of the earth were implicitly kept within Physical Geography during four decades of teaching that discipline in Königsberg (Kant, 1757-1759/1802).

Historical sensibilities in the field of geology and its conceptual precision would be developed with the discovery of both *deep time* and a global vision of a planet with a *history* which was possible to reveal. James Hutton and his *Theory of the Earth* (1785, 1788, 1795) had a marked influence on it. In the first volume of the final version, he continuously uses the adjective *geological* in relation to *theories*, *operations*, *notions*, *examples*, *lessons*, *facts*, *propositions*..., and, on the other hand, he distinguishes *geologists* from *mineralogists*. The term *geology* is only used three times with an implicit meaning: when he speaks of the *geology of this earth*; and for considering her, on the one hand, as a *science*, and, on the other hand, as a *system*, whereas a set of knowledges (Hutton, 1795, vol. I, chap. 7, p. 495; vol. II, chap. VIII, p. 259, and chap. XI, p. 427, respectively), assuming besides its scope.

In the following years, the term also appears on some important works, sometimes related to theories of the earth within a scientific rationality, and even with a certain historical sense (Faujas de Saint-Fond, 1803, p. 1), but also as an explanation of biblical assumptions (Buckland, 1820). This was expressed, for example, in the first of those senses, by the German-Italian geologist Scipione Breislak, and some years later by the English William Phillips, in two works which had a great influence:

> "La geologia si debbe considerare sotto due aspetti, cioè come l'esposizione de'fenomeni che ci presenta la superficie del nostro pianeta e como la spiegazione de medesimi. La prima che forma la parte storica o descrittiva dipende dalle osservazioni; la seconda che costituisce la parte teoretica o razionale, è fondata sopra i raziocinj e le congetture."[13](Breislak, 1811, Proemio, p. V).

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[11] I mean here by *Cosmology* only the knowledge of the *Earth*, and not that of the *Universe*. In this sense, *Geology* would have been the proper word; but I dare not use it since it is unusual (my translation).

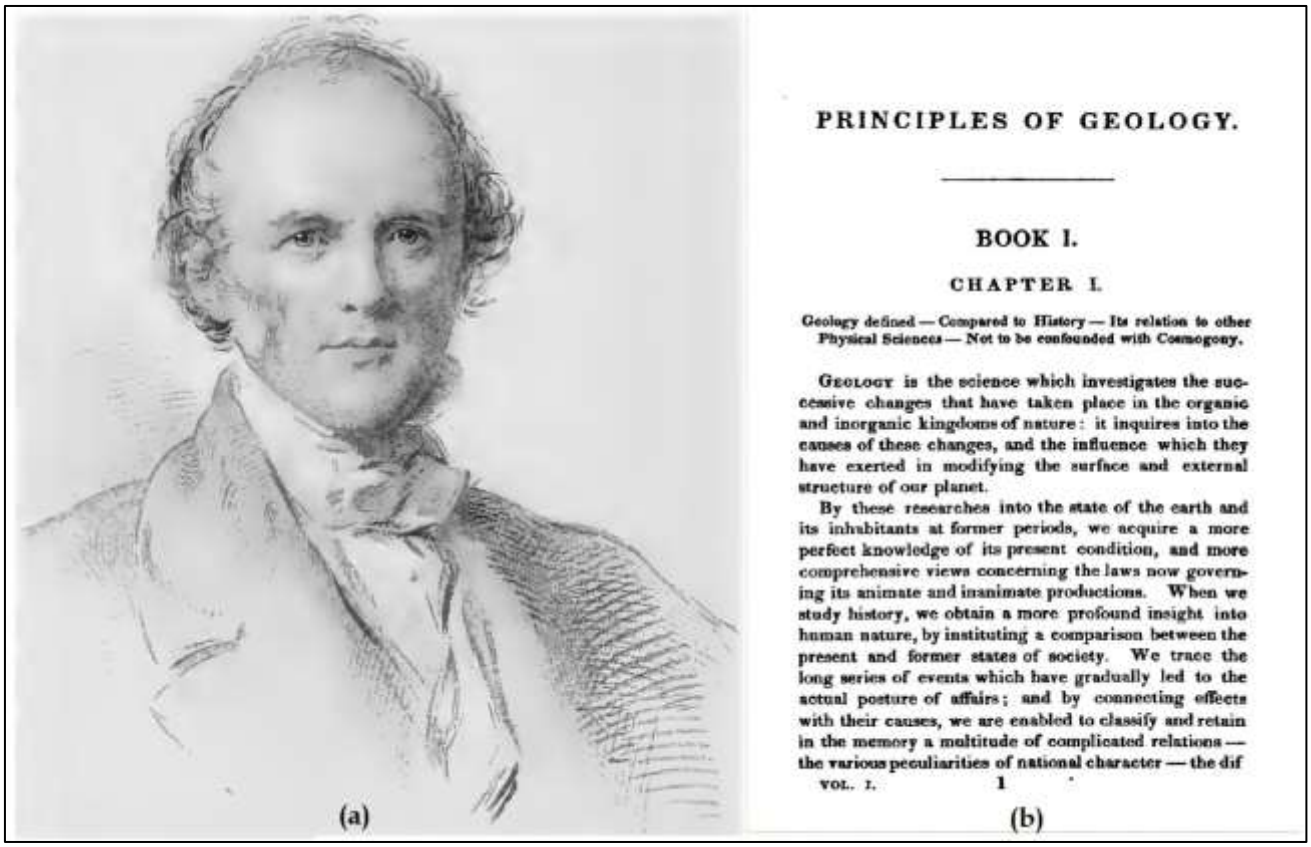
[12] The science that brings together the facts, which can only serve as a basis for Theory of the Earth or *Geology*, is Physical Geography, or the description of our Globe (my translation).

[13] Geology must be considered under two aspects, namely, as the exposure of the phenomena that the surface of our planet presents to us, and as the explanation of them. The first aspect, which forms the historical or descriptive part, depends on the

> "Geology, therefore, in the present true sense of the term, embraces little more than an *inquiry into the history and present state of the surface or crust of the globe*."(Phillips, 1815, p. 67) (original emphasis).

But it was especially Charles Lyell (Fig. 3), in his *Principles of Geology* (1830-1833), who shown clearly the definition of geology, a work which could have just been a *Summa Geologicae* (Gillispie, 1951, p. 127) by analogy with the theological work of Thomas Aquinas:

> "Geology is the science which investigates the successive changes that have taken place in the organic and inorganic kingdoms of nature; it enquires into the causes of these changes, and the influence which they have exerted in modifying the surface and external structure of our planet." (Lyell, 1830, chap. I, p. 1).



PRINCIPLES OF GEOLOGY.

BOOK I.

CHAPTER I.

Geology defined — Compared to History — Its relation to other Physical Sciences — Not to be confounded with Cosmogony.

GEOLOGY is the science which investigates the successive changes that have taken place in the organic and inorganic kingdoms of nature: it inquires into the causes of these changes, and the influence which they have exerted in modifying the surface and external structure of our planet.

By these researches into the state of the earth and its inhabitants at former periods, we acquire a more perfect knowledge of its present condition, and more comprehensive views concerning the laws now governing its animate and inanimate productions. When we study history, we obtain a more profound insight into human nature, by instituting a comparison between the present and former states of society. We trace the long series of events which have gradually led to the actual posture of affairs; and by connecting effects with their causes, we are enabled to classify and retain in the memory a multitude of complicated relations — the various peculiarities of national character — the dif

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(a) (b)

Figure 3. (a) Portrait of Charles Lyell (ca. 1840), engraved by Charles Holl from a drawing by George Richmond (in Lyell, 1881, frontispiece). (b) Text of Principles of Geology wherein the aim of this science is defined (Lyell, 1830, chap. I, p. 1). [Public domain].

Lyell did dedicate the rest of chapter I of his work in defining the scope of geology activities specially as a *historical science*, entailing a time alien to biblical chronologies and, therefore, well beyond of a few thousand years; moreover, his methodology was based on Actualism-Uniformitarianism, as evidenced in the book subtitle:

> "...an attempt to explain the former changes of the Earth's surface, by reference to causes now in operation."

In the next three chapters, Lyell historically analyzes previous cosmogonic ideas about Earth, from Hindus and Egyptians to the early 19th century, taking into account the changes that have occurred in the Globe especially in relation to the distribution

observations; the second one, which constitutes the theoretical or rational part, is based on arguments and conjectures (my translation).

of lands and seas, the origin of organic fossils, the causes of earthquakes and volcanism, strata, mining..., with a harsh criticism of the Deluge and Neptunist approaches (Lyell, 1830, chaps. II-IV). But that already is another history.

Last remarks as conclusions.

From the primary sources, the authority and/or priority of the term *geology* have been analyzed, as well as some erroneous interpretations in relation to it. This word has been found to be ancient, as we have seen, although its definition as a discipline has been quite imprecise for centuries. To Richard de Bury, in the 15th century, belongs the first written reference to geology, as far as we have seen, although it is not possible to know really what he meant by this term because he left nothing explicit about it. What is clear is that Bury never related geology to earthly things *versus* theology.

Almost two hundred years had to pass before this term was related to terrestrial materials. It seems that the naturalists who had been working on terrestrial materials, especially in the extraction of minerals, did not need a comprehensive but concise term with which to define, beyond mining, their activities and other related ideas, despite the fact that the development of geology was largely linked to the mining boom. The concept of *geology* initially given by Aldrovandi in 1603 in this sense as *the study of what is dug out of the earth*, however, on the one hand, it is closer to orictognosia than to geology, and, on the other hand, it seems to have been faded away or dissipated into the time for more than half a century, until a vague and imprecise recovery by Lovell, in 1661, and a hundred years later by Arduino, in 1760. In spite of everything, the works of this last author clearly fit to the context of modern geology, although he does not go so far as to make an explicit definition. In all those years, the meaning of *geology* is practically not specified, and, on the other hand, there was not a systematic theory that gave it entity as a science. Rather, the term was simply used in the titles of some works, perhaps more for following a current of use than with the intention of specifying its scope as a subject of study. Thus, some ideas such as '*general doctrine of the globe*', or '*knowledge of the state and nature of the Earth*', are closer to the modern concept of geology, but they were not developed by the corresponding authors as a scientific activity. It was simply tried to give an answer to the theoretical approaches concerning earthquakes or the Universal Flood as if they were plans of Divine Providence, where Theology was always mixed with Physics for providing a reply in this regard. These works, so, symbolized largely the idea of *theories of the Earth* which had also been forged during that same period opposite rationality, and they were especially based on Sacred Physics.

The contribution of the French encyclopedists in the middle of the Enlightenment also did not elucidate the scope of geology by simply considering her as '*the science of the continents*', a very vague idea in which many other disciplines could have a place, such as zoology, botany or agronomy.

In the last decades of the 18th century, new conceptions of the word *geology* emerged, while Natural History continued to transform itself into the History of Nature, and it was irreversibly segregating from the dogmatic principles of Natural Theology. In continental Europe, nevertheless, more importance was given to Physical Geography. In De Luc's and Saussure's particular case, despite the relevance given in this sense to the first of these authors, the term *geology* seems to be rather secondary: De Luc considered that it was not in regular use, and therefore he refused to use it, despite the fact that his works, like those of Arduino, were fully geological works, and Saussure, from him, thought that Physical Geography was more relevant as a description of our Globe.

In the first third of the 19th century, Lyell, as a heir to a ancient tradition based on the principle of uniformity in nature, and with *deep time* and *actualism-uniformitarianism* as fundamental instruments of his scientific thought, provided *geology* the necessary momentum with a precise definition as a historical science in their *Principles of Geology*, although a few years earlier Breislak and Phillips had also advanced a historical conception for geological science.

Finally, the study of these original texts has also allowed the recognition of some inaccuracies or erroneous interpretations that have become part of the history of Earth Sciences, incorrectly attributing the authorship or priority of this term to some naturalists to whom it really does not correspond. Thus, it has been seen that the term *geology* has been erroneously attributed especially to Aldrovandi, Lovell and De Luc. On the other hand, the origin of this word has also been related to the study of earthly things against the theology which dealt with divine things, an idea that apparently could be traced back to Venerable Bede, in the Early Middle Ages, something that could not be confirmed.

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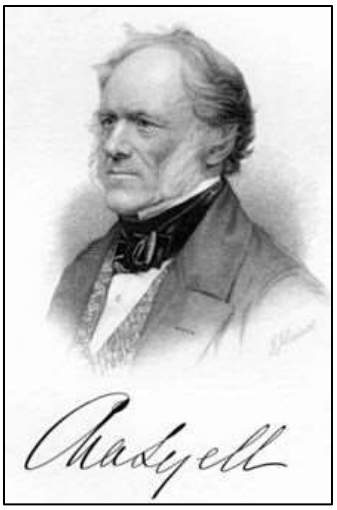
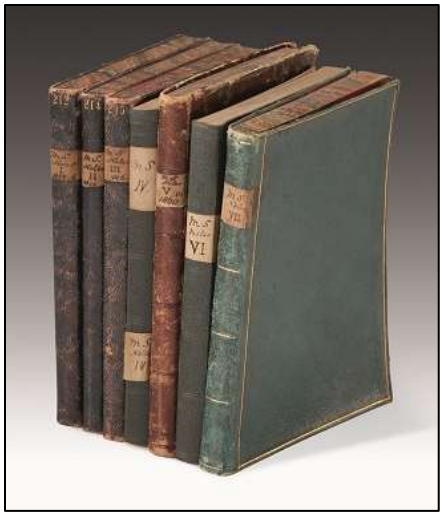
SAVING CHARLES LYELL'S NOTEBOOKS

Dr Andrew Grout
Centre for Research Collections
Edinburgh University Library



Charles Lyell (1797-1875) (https://en.wikipedia.org/wiki/Charles_Lyell).

In 2019, 294 notebooks of the renowned nineteenth-century British geologist Sir Charles Lyell (1797-1875) were put up for auction and sold abroad for a total of £1,444,000. However, a temporary export bar was imposed by the United Kingdom government, giving the University of Edinburgh and over 1,100 supporters, from the UK and many countries around the world, the opportunity to raise the necessary funds to purchase them. Fortunately, thanks to a restructuring of tax liability, the cost was later reduced to £966,000 and the University was successful in its campaign. Through conservation and digitisation, the University now aims to make the notebooks fully and freely accessible and available for collaborative and creative working for the first time.



The notebooks of Charles Lyell

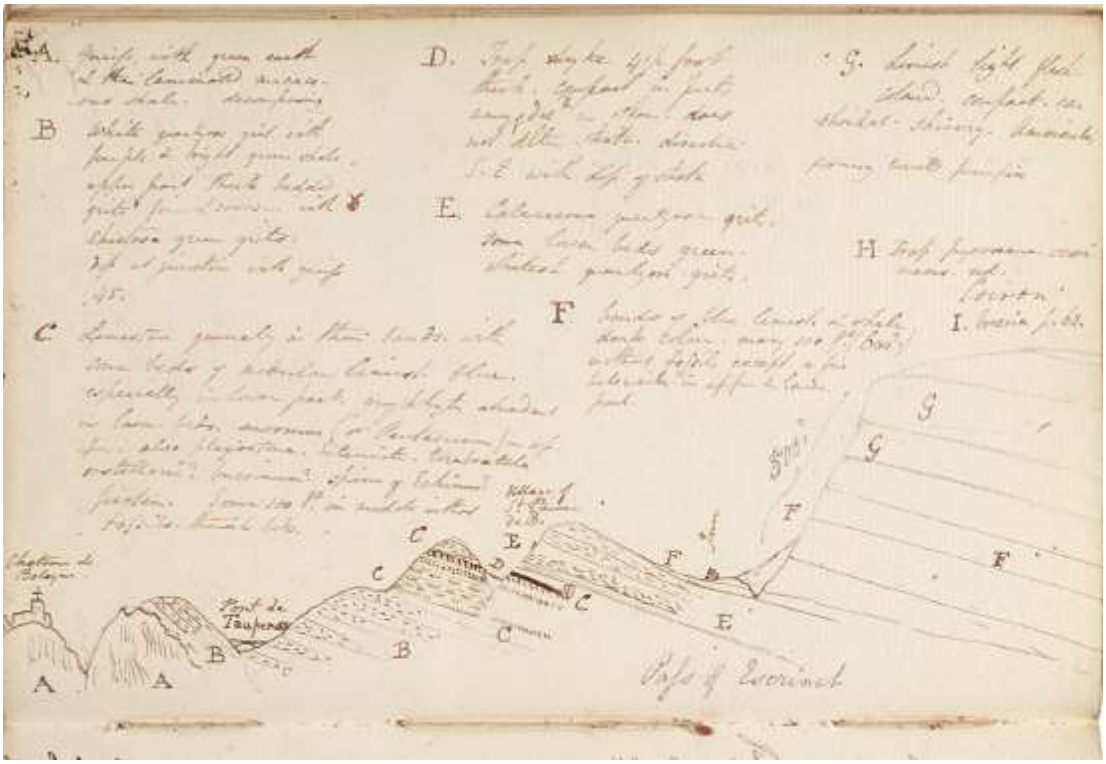
A warm and heartfelt 'thank you' to those (including many members of INHIGEO) who made this acquisition possible!

Lyell was, of course, a key figure in the history of the earth sciences, best known perhaps for his *Principles of Geology* (1830–1833) and for his concept of uniformitarianism. The notebooks contain a wide range of material, including Lyell's field observations, conversations with fellow scientists, and his transcribed correspondence with Charles Darwin.
Included in the collection are ten notebooks kept during Lyell's tour of Italy and Sicily in 1829, which contain his observations on the earth's formation and volcanoes. Seven books contain notes on the origin and antiquity of man, record his private conversations with Darwin, and contain the reactions of key figures to Darwin's theory of evolution. Indeed, Darwin once wrote: "The science of geology is enormously indebted to Lyell—more so, as I believe, than to any other man who ever lived."

Other volumes include his notes from reading books, articles, letters and unpublished manuscripts, and his thoughts on social and political issues, such as slavery in the United States of America, women in science and university education.

"Charles Lyell's importance as a world-leading scientist is unquestioned. His remarkable notebooks are key to appreciating his standing as arguably the most significant figure in the earth sciences in Britain in the past two centuries. They illuminate our understanding of the nineteenth century, and shed light on contemporary concerns including climate change, species diversity and the meanings of deep time." *Charles WJ Withers (Ogilvie Chair of Geography, University of Edinburgh, Geographer Royal for Scotland) and James A Secord, Professor of History and Philosophy of Science, University of Cambridge, Director, Darwin Correspondence Project).*

The notebooks fall into 5 series, the largest of these being Coll-203/A1, the principal *scientific notebooks*. The other series are Coll-204/A2 – travel journals; Coll-203/A3 – scientific journals / manuscript notes; Coll-203/A4 – Madeira and Canaries; and Coll-203/A5 – Indexes. While full cataloguing and digitisation will take some time, skeletal catalogue entries and selected images will be made available online as soon as possible.



A page from one of the notebooks.

Further information, including an ongoing blog about the collection, is available at: https://www.ed.ac.uk/giving/save-lyell-notebooks

RESEARCH ACTIVITY OF THE SAXON GEOLOGIST GEORG GOTTLIEB PUSCH IN POLAND IN THE FIRST HALF OF 19TH CENTURY

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The life and research activity of Georg G. Pusch (Fig. 1) in Poland (the Kingdom of Poland) was closely related to the political and economic history of this country. He arrived from Saxony not only due to considerable development of mining and mining education, but also to work on the geological synthesis of Polish lands, which includes a two-volume work *Geognostische Beschreibung von Polen* and *Geognostyscher Atlas von Polen.* His works have been the basis for scientific analysis and research for years. Pusch was aware of the importance and necessity of his geological activities. His works were conducted in a period when European geology was being created and developed.

Georg Gottlieb Pusch (born on December 15, 1790 in Kohren (near Leipzig) – died on October 2, 1846 in Warsaw) began his research activity in Poland in 1816 when he joined the Mining Academy (Bergakademie) in Freiberg in 1806. He was a student of the famous Abraham Gottlob Werner. After graduating from the academy, he also studied law and theology at the University of Leipzig from 1810 till 1815. While there he wrote his first geology work (1812) which was about Saxony under the title of *Beschreibung einer merkwürdigen Abänderung von Granit und der in ihm beibrechenden Fossilien zu Penig im Königreich Sachsen.*

Fig. 1. Georg Gottlieb Pusch – "Tygodnik Ilustrowany," 1868, vol. 4, no. 80, p. 13.

Pusch was one of the first Saxon specialists who came to Poland in a larger group (at the end of 1816) and started working in the developing mining industry. He was entrusted with conducting lectures in general, metallurgical and analytical chemistry, as well as metallurgy, at the newly established Mining Academy in Kielce. Later, he also taught oryctognosy (mineralogy) and geognosy. He informed Karl Cäsar von Leonhard, the editor of *Taschenbuch für die gesammte Mineralogie*, about the beginning of his work as follows (letter dated January 5, 1817, Kielce – 'Taschenbuch ges. Miner.', XII/II, 1818, p. 605-608):

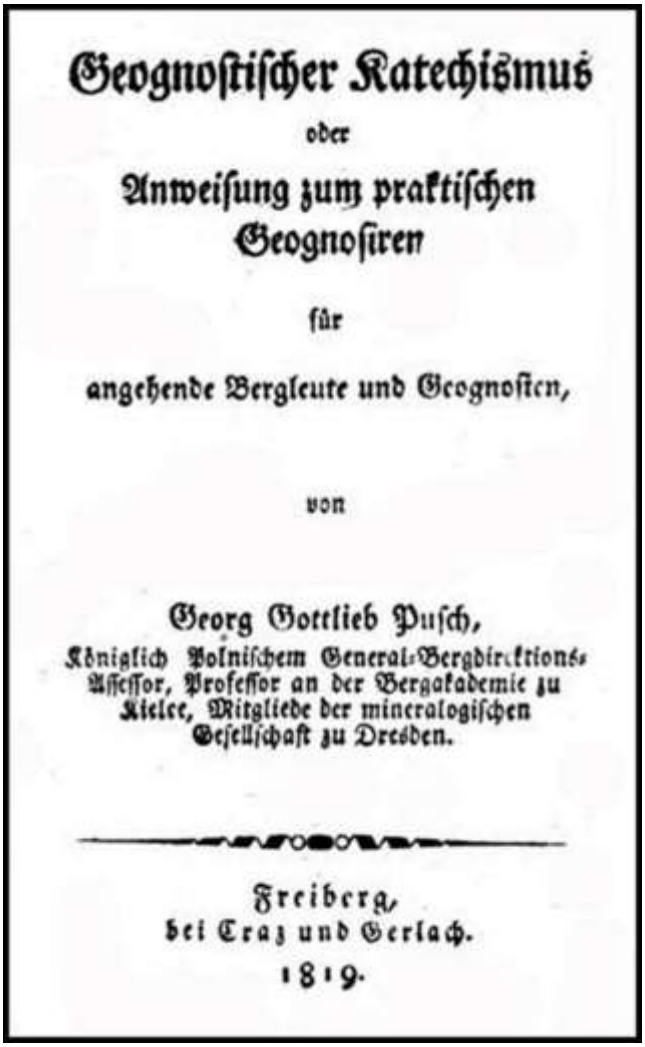
As I wrote to you initially, I am employed here as a professor of chemistry and forging at the newly established Mining Academy and as an assessor at The Directorate-General for Mining. Poland, a country that have been neglected for three centuries and immersed in endless wars, also needs a new organization from a mining point of view. Everything has just begun or needs improvement here; also mining, especially the mine structure is promising, and the Russian authorities left it without support.

While working at the Mining Academy in Kielce, he made many trips (geognostic expeditions) so that he could get acquainted with the geology of the Kingdom of Poland and the adjacent areas. The book published in 1819 (Fig. 2) in Freiberg also should be mentioned here. The author's intention was to provide a guide for students of the Mining Academy in Kielce. The book, containing 232 pages and illustrated with drawings made by the author himself, was entitled: *Geognostischer Katechismus oder Anweisung zum praktischen Geognosiren für angehende Bergleute und Geognosten.* The work contains many recommendations, however, it is worth mentioning those directly related to the work of a geologist:

Do not see more or less than it is in nature.
Keep strictly and conscientiously to the real succession of layers.
In observations, don't get lost in the details, but look at the overview and the overall view.
Do not be deceived by accepted hypotheses, present facts faithfully and conscientiously.
Do not trust your memory too much.

After the closing of the Mining Academy in Kielce in 1827, Georg G. Pusch worked in the mining administration. In 1833 he went to work in the state mint. He worked there until 1842, when, after reorganisation of the Mining Academy in 1843, he became the head of the Mining Department. He actively participated in all visits of foreign geologists, mainly from Prussia, who were coming to the Kingdom of Poland. In 1843 Pusch met Rudolf A. W. von Carnall who came to Poland with Johann Jakob Nöggerat.

The first edition of the synthesis of Poland's geological structure was presented by Pusch in the journal Sławianin as early as 1830 and was entitled: *A brief geognostic overview of Poland and the Northern Carpathians, that is, a description of the external shape and internal composition of the country's land.* This result of many years of research was an extensive two-volume work that came out in Germany in 1833 (Fig. 3): *Geognostische Beschreibung von Polen, so wie der übrigen Nordkarpathen-Länder, erster Theil* (Fig. 4) (J. G. Cotta'sche Buchhandlung, Stuttgart und Tubingen, 1833, p. 1-338) and in 1836: *Geognostische Beschreibung von Polen so wie der übrigen Nordkarpathen-Länder: nebst einem geognostischen* Atlas (J. G. Cotta'sche Buchhandlung, Stuttgart und Tubingen, 1836, p. 1-695). Pusch's work introduced separating rock divisions into smaller units called formations - units separated basically on the basis of lithological criteria.



Geognostiſcher Katechismus

oder

Anweiſung zum praktiſchen Geognoſiren

für

angehende Bergleute und Geognoſten,

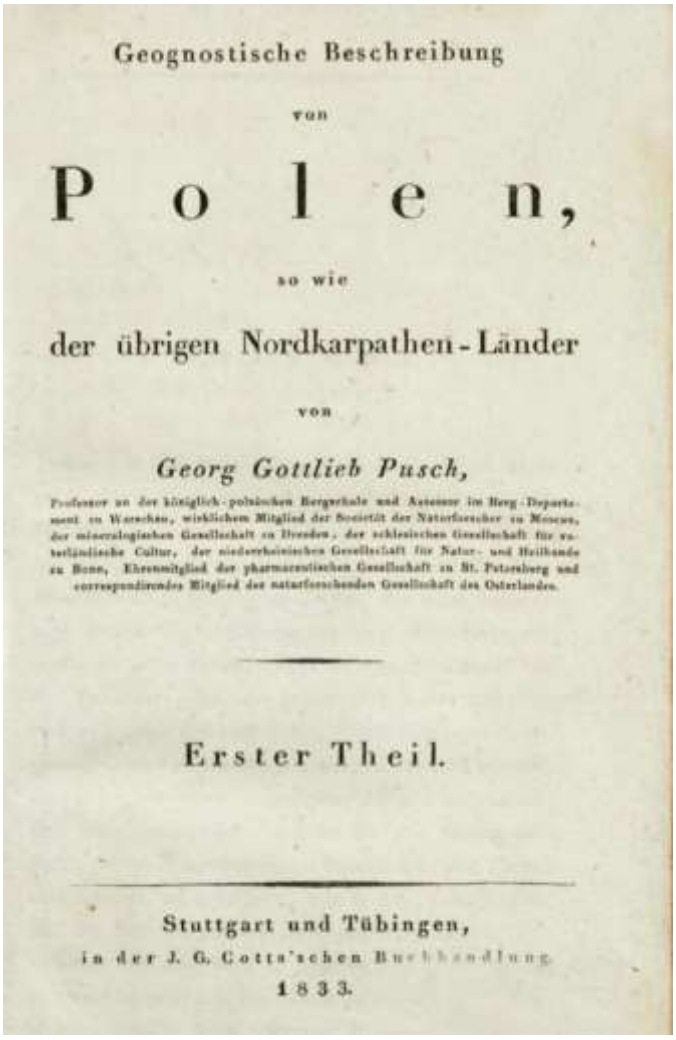
von

Georg Gottlieb Puſch,

Königlich Polniſchem General-Bergdirektions-Aſſeſſor, Profeſſor an der Bergakademie zu Kielce, Mitgliede der mineralogiſchen Geſellſchaft zu Dresden.

Freiberg,
bei Craz und Gerlach.
1819.

Fig. 2. Cover page Geognostischer Katechismus…, 1819.



Geognostische Beschreibung

von

P o l e n,

so wie

der übrigen Nordkarpathen-Länder

von

Georg Gottlieb Pusch,

Professor an der königlich-polnischen Bergschule und Assessor im Berg-Departement zu Warschau, wirklichem Mitglied der Societät der Naturforscher zu Moscau, der mineralogischen Gesellschaft zu Dresden, der schlesischen Gesellschaft für vaterländische Cultur, der niederrheinischen Gesellschaft für Natur- und Heilkunde zu Bonn, Ehrenmitglied der pharmaceutischen Gesellschaft zu St. Petersburg und correspondirendes Mitglied der naturforschenden Gesellschaft des Osterlandes.

Erster Theil.

Stuttgart und Tübingen,
in der J. G. Cotta'schen Buchhandlung.
1833.

Fig. 3. Cover page Geognostische Beschreibung von Polen..., 1833.

Geognostyscher Atlas von Polen (1836) (Fig. 5) was a summary of the geological descriptions of the land in Poland. It consists of a main map, in four sheets: *Geognostische General-Karte von den Königreichen Polen und Galizien mit angrenzenden Theilen von Oberschlesien, Ungarn, Siebenbürgen, Moldau und Podolien*, hand-coloured, 1:792 000 scale and regional maps, 1:176 000 scale: *Geognostische Karte der Polnischen oder Sandomierz Mittelgebirges zwischen Sandomierz und Malagoszcz*, *Geognostische Karte der Gegend zwischen Krzeszowice, Czeladz und Pilica*, *Geognostische Karte der Gegenden zwischen der Weichsel und Nida* and *Geognostische Specialkarte von der Gegend um Krzeszowice, Nowagora und Szklary*, 1:140 000 scale. Push informed Karl Cäsar von Leonhard, the editor of *Zeitschrift für Mineralogie* about his research works (letter dated March 18, 1827, Kielce – „Zeitschr. Miner.", XXI/I, 1827, p. 511-512:

I am currently working hard on a comprehensive study of Polish geology; the maps are mostly ready. The main map, which stretches from Odessa to Kosel, is going to fill a huge gap in the geological knowledge of Eastern Europe [...] In the south, the map shows the Carpathian range with magnificent sandstone formations and the limestone-nummulite strip, which I misjudged in 1821 and whose location in geological classification is extremely difficult, but very valuable for the needs of comparative geology.


Geognostische Beschreibung

von

Polen,

so wie

der übrigen Nordkarpathen - Länder

von

Georg Gottlieb Pusch,

Nebst einem geognostischen Atlas.

Zweiter Theil.

Stuttgart und Tübingen,
in der J. G. Cotta'schen Buchhandlung.
1836.

Fig. 4. Cover page *Geognostische Beschreibung von Polen...*, 1836.


GEOGNOSTYSCHER

ATLAS VON POLEN

entworfen und gezeichnet von

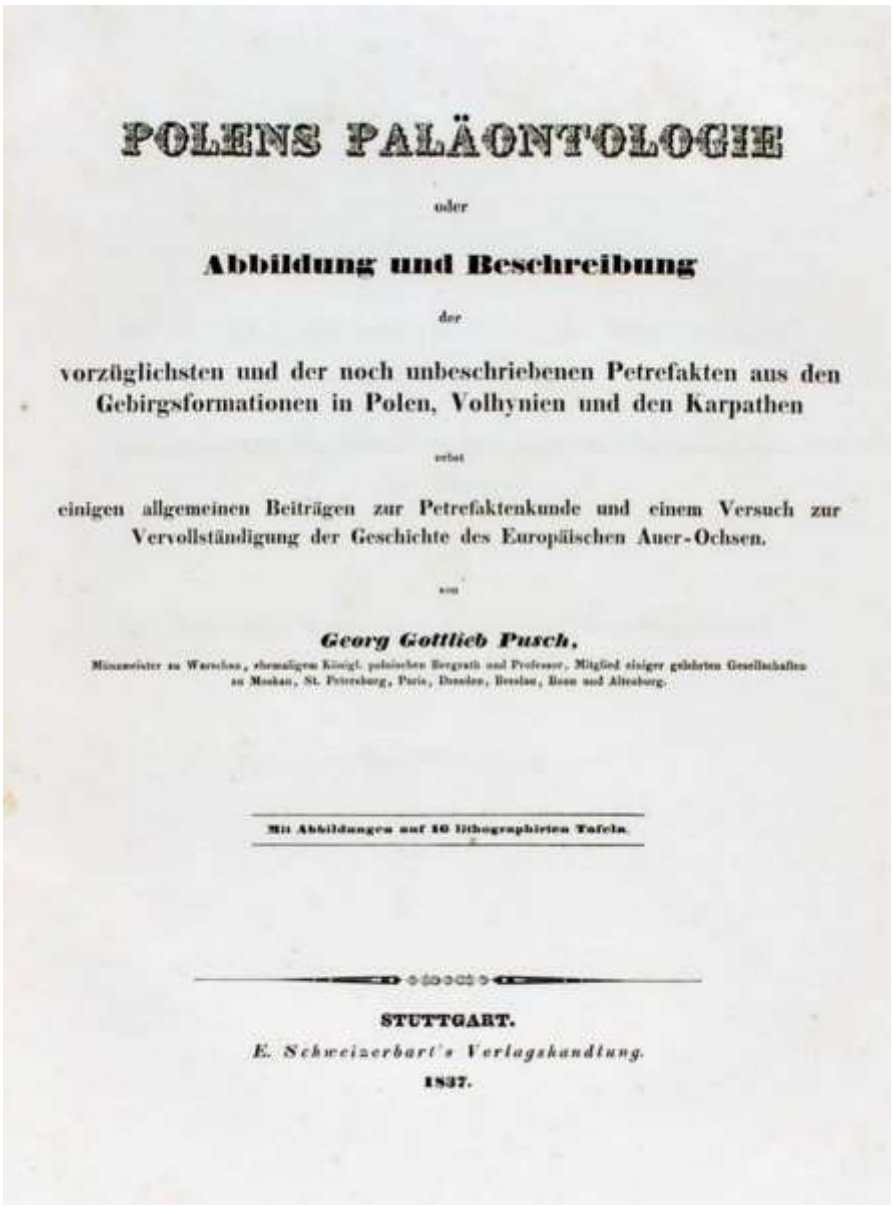
G. G. PUSCH

1836.

INHALT

Fig. 5. Cover page *Geognostyscher Atlas von Polen,* 1836.

Pusch appreciated the chronological value of organic fossils. His field studies were mainly aimed at determining in which units useful minerals occur. Nevertheless, the studies broadened the knowledge to date, and thanks to describing the fossils found in various types of rocks, they gave a solid foundation for biostratigraphic and paleontological studies. This became especially important in the work from 1837 (Fig. 6) entitled *Polens Paläontologie: oder Abbildung und Beschreibung der vorzüglichsten und der noch unbeschriebenen Petrefakten aus den Gebirgsformationen in Polen, Volhynien und den Karpathen nebst einigen allgemeinen Beiträgen zur Petrefaktenkunde und einem Versuch zur Vervollständigung der Geschichte des Europäischen Auer-Ochsen* (E. Schweizerbart's Verlagshandlung, Stuttgart, p. 1-218).



POLENS PALÄONTOLOGIE

oder

Abbildung und Beschreibung

der

vorzüglichsten und der noch unbeschriebenen Petrefakten aus den Gebirgsformationen in Polen, Volhynien und den Karpathen

nebst

einigen allgemeinen Beiträgen zur Petrefaktenkunde und einem Versuch zur Vervollständigung der Geschichte des Europäischen Auer-Ochsen.

von

Georg Gottlieb Pusch,

Münzmeister zu Warschau, ehemaligem Königl. polnischen Bergrath und Professor, Mitglied einiger gelehrten Gesellschaften zu Moskau, St. Petersburg, Paris, Dresden, Breslau, Bonn und Altenburg.

Mit Abbildungen auf 10 lithographirten Tafeln.

STUTTGART.

E. Schweizerbart's Verlagshandlung.

1837.

Fig. 6. Cover page *Polens Paläontologie...*, 1837.

Maps and works made by Georg Gottlieb Pusch, which resulted from many years of geological research, reflected the contemporary state of knowledge. He introduced a unification of the description and presentation of geological phenomena in the whole region (Fig. 7). At the beginning Pusch's research activities were optimistic. His correspondence, published in German magazines, shows that there was a very good atmosphere here, and specialists from Saxony received a decent salary. It all favoured conducting research work. It should be emphasized that Georg G. Pusch was a member of many associations and organizations, including, among others, the Warsaw Society of Friends of Science (from 1831), the Moscow Society of Naturalists (from 1829) and the Geological Society of London (from 1841).

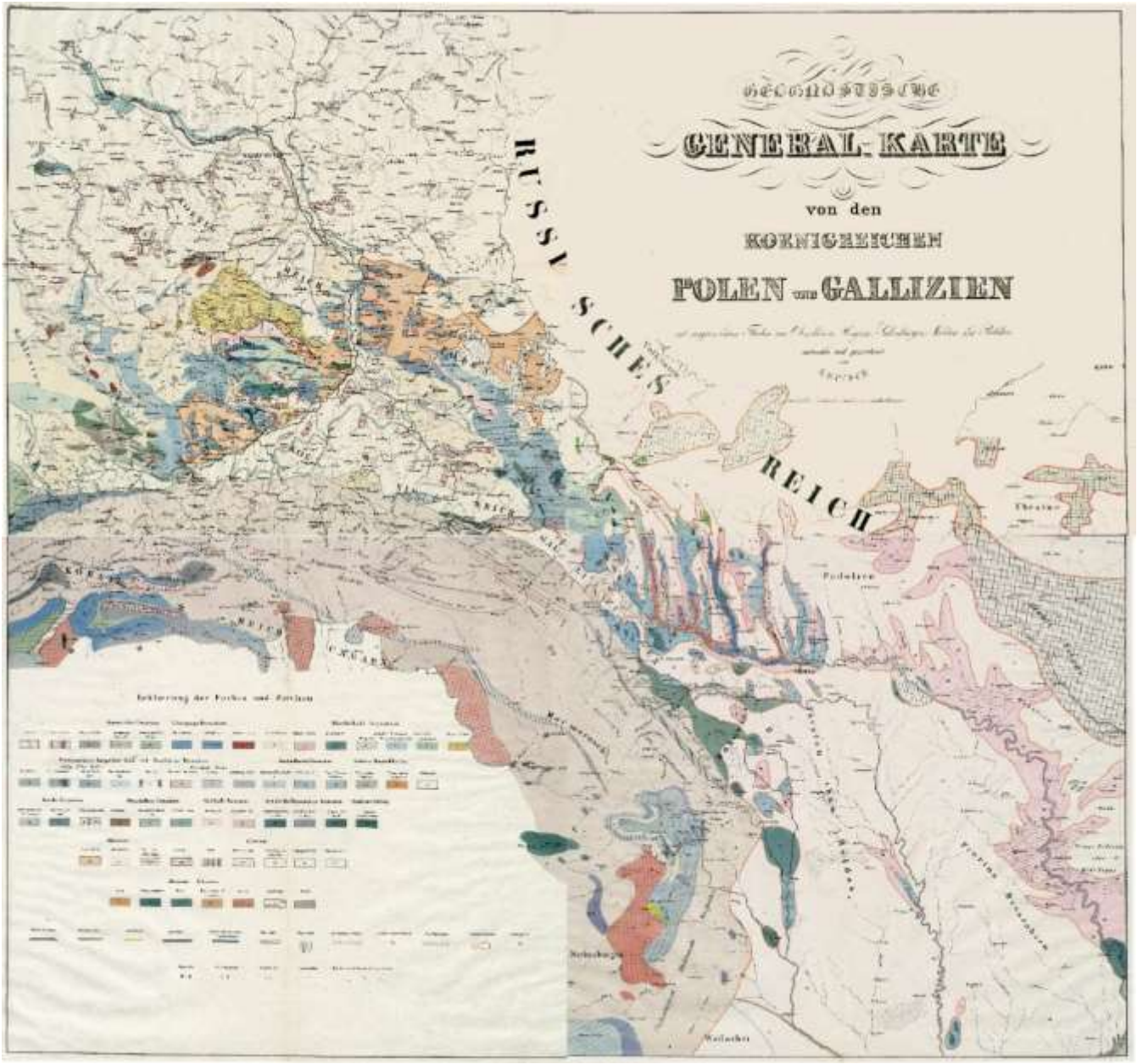


Fig. 7. Main map *Geognostische General-Karte von den Königreichen Polen...*, 1836.

Other scientific works of Georg G. Pusch published in German magazines:

1812: *Beschreibung einer merkwürdigen Abänderung von Granit, und der in ihm brechenden Fossilien zu Penig in Sachsen*. "Taschenbuch ges. Miner.", VI, s. 126-151.
1817: *Kritische Betrachtungen über das Berzeliussche Mineral-System*. "Taschenbuch ges. Miner.", XI/II, s. 471-524.
1818: *Kritische Bemerkungen über das Mineral-System des Herrn Berzelius.* "Taschenbuch ges. Miner.", XII, s. 3-66.
1823: *Bemerkungen über Herrn v. Oeynhausens Versuch einr geognostischen Beschreibung von Oberschlesien und den nächst angrenzenden Gegenden von Polen, Galizien und Osterreichisch-Schlesien*. "Miner. Taschenbuch", 4, s. 751-788.
1829: *Ueber die geognostischen Konstitution der Karpathen und der Nordkarpathen Länder. Eine geognostische Skizze*. "Archiv f. Miner.", 1, s. 29-55.
1838: *Über einen fossilien Krebs aus Polen*. "Neues Jahrbuch", s. 130-135.

1838: *Geognostische Beschreibung von Polen, so wie der übrigen Nordkarpathen-Länder*. "Archiv f. Miner.", 11, s. 410-475.
1839: *Ueber die geognostichen Verhältnisse von Polen nach neueren Beobachtungen und Aufschlüssen*. "Archiv f. Miner.", 12, s. 154-173.
1841: *Uebersicht der Bergbau, Hütten- und Salzwerkskunde bezüglichen Abhandlungen und Aufsätze, welche sich in verschiedenen periodischen Schriften zerstreut befinden, von 1740 bis 1830*. "Archiv f. Miner.", 14, s. 154-173.

Reference list

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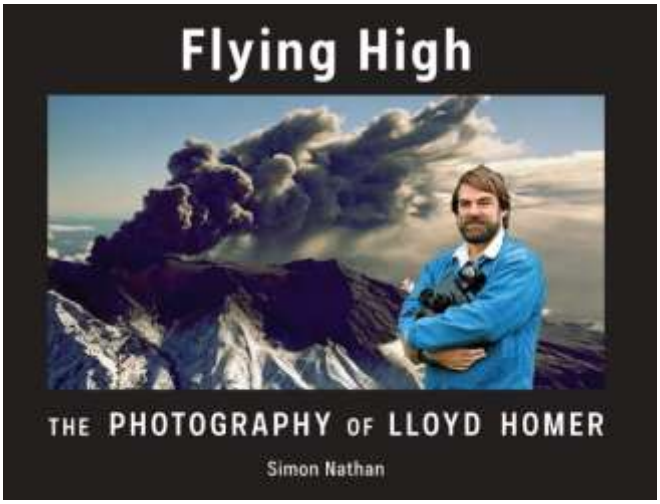
Kleczkowski, A. S., 1972, *Jerzy Bogumił Pusch. Życie i dzieło w okresie Królestwa Polskiego (1816-1831)*. „Stud. I Mater. z Dziej. Nauki Pol.", Ser. C, z. 17, s. 123-150.
Kleczkowski, A. S., 1974, *Jerzy Bogumił Pusch - ostatni okres życia i działalności 1830-1846*. „Pr. Muz. Ziemi", z. 21, cz. 2, s. 65-104.
Wójcik, A. J., 2010, *Georg Gottlieb Pusch i jego działalność w Królestwie Polskim w świetle korespondencji publikowanej na łamach niemieckich czasopism mineralogicznych (1817-1830*). „Zeszyty Staszicowskie", z. 8, s. 149-165.

BOOK REVIEWS

FLYING HIGH – the Photography of Lloyd Homer. By Simon Nathan. Published in 2019 by the Geoscience Society of New Zealand, *Miscellaneous Publication 153*. 148p. ISBN: 978-0-473-46347-2. NZ$45.00.



The cover of Flying High depicting outstanding internationally recognised photographer Lloyd Homer backgrounded by an erupting Mt Ruapehu (2797 m) in the North Island's Taupo Volcanic Zone.

INHIGEO member Simon Nathan has compiled another book documenting the history of geology in New Zealand. In this book Simon features internationally recognised photographer Lloyd Homer who for many years was employed in recording through his camera the activities of the New Zealand Geological Survey and its successor GNS Science. This included photographing the varied landscapes of New Zealand, a reflection of it being astride the active boundary between the Pacific and Australian plates in the southwest Pacific Ocean. The book appropriately acknowledges Lloyd's skill and dedication by including numerous examples of his work. Simon must have had a challenging task choosing photographs from the 100,000 or so that were taken by Lloyd and which are now held by GNS Science (the successor to the New Zealand Geological Survey) in Lower Hutt, New Zealand.

Adopting the maxim that a picture is worth a thousand words, the greatest amount of space has been devoted to photographs and the text has consequently been kept to a minimum but with sufficient detail to get an appreciation of Lloyd's career over 30 or more years. While this could be seen as an injustice to Lloyd, and his supportive and understanding wife Sheryl, the images the book contains, and their captions, more that compensates for the reduced text. Lloyd a keen outdoor man joined the Geological Survey as a trainee draftsman in 1959, a role that brought him into contact with geological maps and more importantly the geologists who were doing the fieldwork on which they were based. Opportunely Lloyd was able to transfer into the photographic section of the survey, which meant that he was able to document the day to day work of geologists. This included photographing fossil and mineral specimens collected each field season and also to accompany geologists in the field to capture on film important rock exposures. It has to be remembered that these were the days when cameras used black and white film and good quality models were expensive to purchase. Field geologists could rarely afford more than a basic camera

and their bulk tended to make them lesser priority in the days when going into the field meant arduous trips on foot into forested mountains. Besides this most geologists did not have the requisite skills to take good photographs, something that Lloyd was, by example, quick to demonstrate. Volcanic eruptions and devastating earthquakes also convinced many outside of the geological world of the numerous advantages in photographing the results of such disasters

The book is divided into 16 main sections beginning with Lloyd's apprentice photographic years, initially using black and white film. This is followed by his introduction to aerial photography, at first involving air force helicopters engaged in disaster assessments or hitchhiking on Civil Aviation DC3 calibration flights. As the DC3 was not pressurised, Lloyd could open the window and take photographs as the obliging pilot manoeuvred the plane into the optimum position. When the DC3 was phased out and replaced by a more advanced pressurised aircraft, the Geological Survey began hiring single engine light planes from aero clubs. This meant the rear door could be removed from the plane and Lloyd, firmly strapped in and warmly clad, could take photographs while directing the pilot over the intercom so as to ensure the best angle and lighting to capture the subject matter.

Lloyd Homer in action. The aircraft door has been removed to ensure photographs are of the highest possible quality and Lloyd is appropriately dressed to combat the cold. Photo: Alan Knowles

This was especially so for photographing active fault scarps that needed shadow to highlight them otherwise they would remain almost invisible. As well as documenting volcanoes (whether active, quiescence or dormant) there are sections on the landscapes within national parks, including one on New Zealand's highest mountain the 3,724 m Aoraki-Mt Cook in the Southern Alps. Because the alps are rising geologically rapidly, they are prone to rock falls, including one spectacular failure in 1991. Lloyd was quickly airborne to photograph the result. There are two sections labelled 'Scientists at Work' which portrays the varied work undertaken – from forensic work to penetrating underground in mines and caves. Many of these give an insight into how geoscience was practised in the later part of the 20th and early 21st centuries and which has now been supplanted by interpretations gathered and analysed electronically. For this alone the book is a valuable historical record.

Flying low to capture the Edgecumbe Fault, which ruptured on 2 March 1987. This shallow 6.3 earthquake cause widespread damage in the Bay of Plenty region of the North Island. Photo: Lloyd Homer, GNS Science

The final chapters include photos Lloyd took for the Hong Kong Geological Survey and of the Hawaiian volcanoes. As a young country, it is not only the landscape of New Zealand that is quickly evolving, but also its buildings. Lloyd on retirement from GNS recorded the streetscapes of Wellington where buildings, many of wood, were being replaced due to decay or earthquake damage. These photographs will as time goes by become an increasingly valuable historical database.

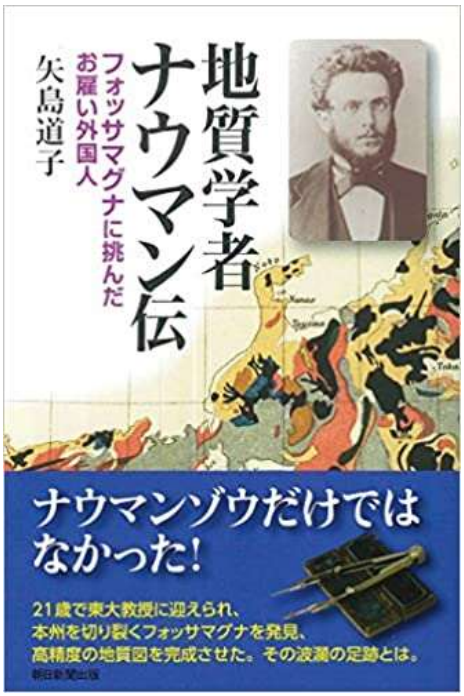
Being a pioneer in aerial photography, flying presented discomfort and risk to life. It can be very cold at 6,700 metres in a light plane with no door. Getting close to mountains was also a hazard and resulted in two plane crashes and, due to loss of engine oil, a forced landing in the New Zealand back country. Lloyd and the other occupants of the planes fortunately survived these mishaps without serious injury.

In conclusion, *Flying High* is a book of considerable relevance to those with an interest in aerial photography and understanding how geological surveys used to operate before the days of electronic communication and the growth of an overbearing bureaucracy. More specifically the book is a great way to admire New Zealand's spectacular geology and scenery in outstanding photographs, especially from the air. Historians of geology owe much to Simon for his documentation of the achievements of an outstanding pioneer in aerial photography. These achievements can be easily underestimated in the present era of digital cameras and the use of drones.

Mike Johnston, Nelson, New Zealand

YAJIMA M. 2019: *Chishitsu-gakusha Nauman den:* Fossa magna *ni idonda oyatoi gaikoku jin* [Biography of Edmund Naumann, geologist: A foreign employee who explored *Fossa magna*], Asahi Shimbun Publications, Tokyo. 320+45 p.

In October 2019, Michiko YAJIMA published a Japanese book of her long-term research that she had kept for about a quarter century. The target of her research is a German geologist, Edmund Naumann (1854-1927). Though many Japanese people associate his name of the fossil of an extinct elephant (Naumann Elephant), he was engaged in geological researches of Japan in the early Meiji Era. Little remains his geological fame except his advocate of so-called *Fossa Magna* in the central Japan. More than that, according to Yajima, in The University of Tokyo, where he once belonged, Naumann's fame has never been favorable for a long time. Therefore, his name and fame has almost submerged into obscurity. In the introduction of the book, she frankly expressed her doubt of this low reputation. She says that this was the beginning of her long research. As my main field is American studies, I admit that I am unqualified to assess her achievement adequately in geology. Accordingly, this book review will mainly be the one grounded on a historical or cultural point of view.



Excluding both the introduction and conclusion, there are ten chapters in this book. Its composition is as follows: one chapter is for Naumann's early days in Germany, seven for Naumann's life in Japan, and two for his days after his going back to Germany. Her style of research is to gather and accumulate facts through steady research. As a result, it is a book performed with positivism and written in plain Japanese. Her main concern seems to be Naumann's Japanese days (1875-85) because of the accessibility of research materials, but occasionally she tried to obtain some of them in Germany, and even to have contacts with Naumann's descendants directly.

Hired by the Meiji Japanese Government that was working vigorously toward modernization, Naumann attempted to engage in geological survey of Japan except Hokkaido and Okinawa area. Based on the documents written by Naumann himself, his disciples, and his colleagues, *i.e.* other foreign advisors like him, Yajima examines his researches in Japan in detail. His enduring achievements were to advocate the existence of *Fossa Magna* and Grosse Medianspalte (Median Line), and his achievement is still shared among geologists. However, as mentioned before, he has been almost forgotten.

The chief reason why Naumann has suffered such relatively low reputation may be the influence of a few of his "opponents." On the one hand, writer and army surgent Ougai Mori, who criticized Naumann publicly during his study in German, has long been positioned as so-called literally canon especially in the field of Japanese literature. On the other hand, in the field of geology in Japan, after the departure of Naumann, Toyokichi Harada, critical to *Fossa Magna*, took the initiative in Japanese geological scene. Though Yajima finds some favorable comments toward Nanmann at the time of Harada's supervision, they were limited to indirect references. Under his supervision, scholars sympathetic to Naumann appeared to have difficulty in expressing honest praises to his opponent.

I would like to suggest two possibilities for further researches. In the first place, it seems possible to explore the geological and academic contribution of Naumann's Japanese disciples, for whom Yajima consults only in tracing his Japanese days. Though difficult and time-consuming, there is nothing more than raising disciples as to keep one's influence in the future. (Without this, scholarship will diminish. The influence of a scholar destines to be lost inevitably.) Considering their influence

will lead Naumann's evaluation to be more precise and appropriate.

Secondly, Yajima's research will contribute to the historical study of Meiji-Era Japan. After achieving modernization in the middle of the Meiji Era, the Japanese government began to dismiss the foreign advisors. Instead, important posts were provided for the native people with the experience of foreign study. The post that Naumann had occupied came to be replaced by the Japanese successors like Toyokichi Harada. Probably, other fields followed similar processes like geology. Comparison of the treatment of foreign advisors and their successors in each academic field will become a sort of "interdisciplinary studies," which has been popular at least in Japan recently. More than that, though the Japanese have seldom noticed, Japan has experienced two extraordinary developments from the viewpoint of world history: one is the rapid modernization in Meiji Era and the other is the restoration after the World War II. It has given great impacts to the world, so it is certainly significant for Japanese people to analyze and impart these two modernizing processes.

Lastly, through reading this book, I reconfirm the importance of tracing the activities and relations of one person carefully and patiently, instead of depending on shallow and unpractical theories. Though never outstanding, careful and patient research will produce a dependable outcome.

Tomomi Nakagawa

Bryanchaninova N. I., Pystin A. M., Kalinin E. P. **Life measured in kilometers: Dedicated to the 100th anniversary of M. V. Fishman and N. N. Kuzkokova** / Ed. academician A. M. Askhabov. Syktyvkar: Komi Scientific Centre, the Urals Branch of the Russian Academy of Sciences, 2019. 118 p., 56 colored inserts with photos. (in Russian) URL

Annotation of the publishers: The book is dedicated to the centenary of the birth of Mark Fishman and Nina Kuzkokova (*Kuz'kokova*), two outstanding scientists and conveners of the Institute of Geology of the Komi Science Centre. Herein the biographies and scientific work and major results of their activities are described. The book, also, contains the bibliography of the published works of these scientists as well as the index of books devoted to them and memoirs of their children, colleagues and friends.

The book is about the married couple, both geoscientists who have devoted their lives to the geological exploration of the north-east of the European Russia.

N. Kuzkokova (born in Syktyvkar) and M. Fishman (born in Simferopol, Crimea) met at the Technical Institute (town Novocherkassk, the south of Russia). The World War II stopped their education and separated them. N. Kuzkokova was back in Syktyvkar and worked in geological expeditions. M. Fishman went to the front in 1941 and was demobilized in 1946. The young people met again in 1947 to finish the education and not to ever part from each other. The Chapter about their geological works is not only about their devotion to the work but is the evidence of the history of geological studies in the Komi Republic.

For 20 years (1951-1971), N. Kuzkokova was the Scientific Secretary of the Presidium of the Komi Branch, the USSR Academy of Sciences. Since 1948 M. Fishman has worked at the Komi Branch of the USSR Academy of Sciences, and in 1951 joined the Institute for Geology. He headed the Institute in 1961-1985.

The work of M. Fishman as the leader of the scientific school was very effective and has many followers in geological exploration of the north-eastern European Russia. The article about his geological results is interesting even now.

M. Fishman (1919-2003) and N. Kuzkokova (1919-1999) were the founders of a geological dynasty; both their sons and a daughter are working in geology and mining, and geology was a choice of their grandson Mark. The family has a lot of friends and like-minded persons, so the book has an original structure. The biographies, analysis of scientific and organization work

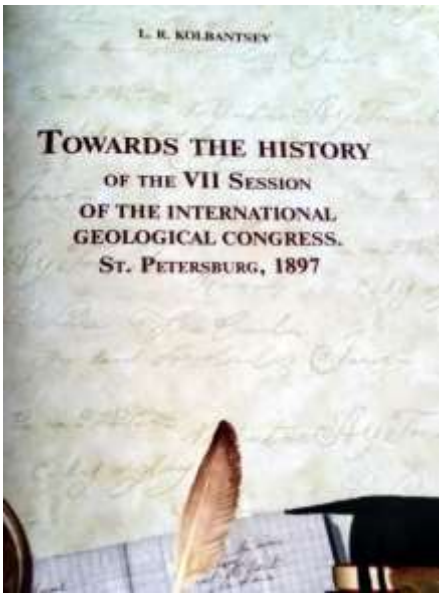
of the couple described by various people - relatives and colleagues are the authors of numerous memoirs. But reiterations of some facts give a perfect chance to look at them from different foreshortenings.

There are full lists of bibliography for the both scholars in the monograph. The calendars of their lives are compiled. Very valuable if the photo gallery with rare pictures from various personal archives.

And, in conclusion, - the book is the example of the good memory of the couple and was written and compiled by professional and attracted people.

Irena G. Malakhova, Geological Institute, Russian Academy of Sciences. Moscow, Russia.

Kolbantsev L. R. **Towards the history of the VII Session of the International Geological Congress. St. Petersburg, 1897: Bibliographic review**. St. Petersburg: VSEGEI Press. 2019. 48 p. (In Russian & in English).

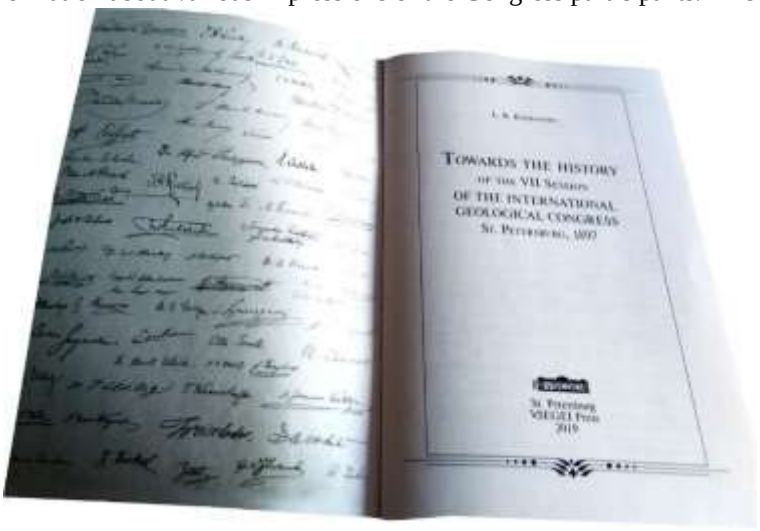


The year 2020 was the time for the 36th International Geological Congress (IGC) (New Delhi, India). This geological forum was very important for our country because the Russian proposal to hold the 38th IGC in Russia (Saint-Petersburg, 2028) was to be discussed. The COIVD-2019 has changed the schedule and the meeting is now set for this November. So, the question about the number of "Russia sessions" is open.

But we can talk about three past IGC meetings in Russia - the 7th Session (Saint-Petersburg, 1897), the 17th one (Moscow, 1937) and the 27th Congress (Moscow, 1984).

The Russian delegation prepared a lot of information materials for presentation and delivering. There is a small but very interesting book by Leonid R. Kolbantsev, a member of the delegation from the A. P. Karpinsky Russian Geological Research Institute (VSEGEI). The subtitle of the book is "bibliographic review" but this main chapter has the important introduction on the history of the first Russian Session in Saint-Petersburg in 1897. All the information is based on publications and archive documents. VSEGEI as the successor of the Russian Geological Survey (Geological Committee) founded in Saint-Petersburg in 1882.

The author of the book is the first who has collected information about various impressions of the Congress participants. This part with many rare pictures is the most interesting part of the book. All annotated bibliographic references are divided into proceedings of the Congress and publications of participants compiled after the visit of Russia (reports to scientific institutions, travel notes, and memoirs). Many signatures of the Congress participants have the perfect effect of the book design.



Book contents includes: Session preparation; Saint Petersburg Session work; Field trip program; Impression of the participants; Bibliography of the 7th IGC Session; and References.

In conclusions, I hope the author will continue his research work in the history of the IGC and, also, to hear the positive decision of the "Russian question" in New Delhi in November of 2020.

Irena G. Malakhova, Geological Institute, Russian Academy of Sciences. Moscow, Russia

Baskina V. A. **Female geologists of Russia.** St. Petersburg: Nestor-Istoriya, 2019, 744 p. (in Russian)

The book tells the life stories of 24 women, who consciously chose the hard job of a geologist, describing their achievements and discoveries, bitter disappointments and losses. The stories of the past give an objective picture of the life of the scientific society in the 20th century - a period of intense development of geological research on the territory of the Soviet Union - till present times. The reviewed book is a solid scientific work, touching upon the currently acute gender topic.

The author pictures different experiences of professional self-realization of female geologists, most of whom worked at the same scientific institution. The author gathered an extensive historical and biographical set of facts and personally interviewed the respondents, who worked or still continue working in research. This allowed her to demonstrate how the topics and course of research changed over time, taking their toll on the careers of the women.

This is the first work that focuses on this particular social group that exposes through personal stories of female geologists a clear dependency on the male colleagues and their higher position in the hierarchy. The author fairly points out that the destinies of the female discoverers in the history of Russian science still remain unnoticed and not fully appreciated. This turned out to be a very sensitive topic for several heroines of the book.

The memories read easy, sometimes with sweet bitterness, as besides hardships they picture happiness and fulfillment – a common goal, true friends and support of colleagues. Particularly touching and thrilling, sometimes romantic, are the stories of the military and civil life of the middle of the 20th century and later, in "after-perestroika" at the end of the century. The narration is built up in a logic way, in the same style and unformal story line for all the actors, the central problems are developed clear and unobtrusively.

Describing gender problematic at the research institution. V. A. Baskina puts the emphasis on the disbalance and asymmetry. However, as she points out herself, the existing asymmetry does not prove discrimination. Still the author underlines her demand for a more discussion-friendly and open atmosphere for equal rights and respect that are necessary for the realization of mature scientists and professional development of young scientists. But to my mind this is already a social problem of a much bigger scale.

The book is not going to leave even a cold skeptic indifferent. The personal character of the stories of the distinct social group (Russian female geologists) reminds the reader about the most important values in life and the significance of the choice of profession and mission to lead one to success. The book lures a person into reading again and again, so I strongly recommend everyone to read it.

Nataliya I. Bryanchaninova, Geological Institute, Russian Academy of Sciences. Moscow, Russia

Russian Mineralogical Society through the eyes of contemporaries: Collection of articles on the history of geological knowledge. Saint Petersburg, Lema, 2019. 235 p. (in Russian)

The Russian Mineralogical Society (est. 1817), throughout its history, was intensively involved in publishing. In addition to the journal *Zapiski RMO* (*Proceedings of the Russian Mineralogical Society*), which publishes scientific articles and reports in the fields of mineralogy, crystallography, petrology, economic geology, and geochemistry, specialized digests on mineralogical topics were issued regularly. There is a full-text archive of periodicals and monographs on the Society's website, as well as a free full-text scientific materials database of the Russian Mineralogical Society conferences.

In anticipation of the 200th anniversary of the Society, Digests of articles on the history of geology were started issuing in order to systematize the knowledge on the history of the Society, the history of geological research in Russia, in which members of the Society played a significant and sometimes even leading role. In 2014-2017, four books of this series were published.

They covered different aspects of the history and activities of the Russian Mineralogical Society, its Branches, Commissions, an analysis of the work of scientists, active Members of the Society who have made an outstanding contribution to the mineralogy development.

The fifth Digest in the historical series was brought out in 2019 (above cover). It contains various articles on the history of geology, grouped in four sections: "Persons", "Events", "Texts", "Translations." The articles present archival items, previously unpublished manuscripts, and little-known materials. The Digest as a whole, shows an unchanging interest in historical studies among members of the Russian Mineralogical Society.

There are articles of particular interest in the "Personalities" section. One of them (by Yury B. Marin, the Chairman of the Russian Mineralogical Society) is devoted to the 90th anniversary of Dmitry V. Rundqvist, a well-known Russian scientist who led the Russian Mineralogical Society for over 30 years and improved the efficiency of the work of the Society. Other noteworthy articles tell about V. von Geidinger and Paul Y. von Groth, the outstanding Austrian and German mineralogists, Honorary Members of the Russian Mineralogical Society (by Irena Malakhova et al.) and our coevals: Y. V. Kazitsyn, V. A. Cherepanov, B. V. Chesnokov (by Rimma Brodskaya and Sergey Potapov). I would like to pay special attention to the article about Sarah I. Futergendler, an outstanding experimental scientist, expert in X-ray crystallography of minerals, particularly diamond and lonsdaleite as a special topic of her research (by Valery Silaev *et al*.).

The section, "Events," is presented by two articles about expeditions that would invariably be of interest for both scientists and natural history lovers: A. von Humboldt expedition to Russia (on his 250th birthday) and the Russian Polar expedition led by E. V. Toll', whose previously unknown letter is published for the first time with Ivan Vtorov comments. Very impressive is the article by Elena Putintseva on the geological collections of N. M. Przhevalsky, the great explorer of Central Asia. A curious and very useful article is one on discovery of amber and fossil resins in the Russian Arctic zone by Olga Martirosyan. The author has analyzed the history of discoveries and presented their correct analysis.
The section, "Texts," fully written by Yury Voytekhovsky, contains a story of rare geological books, thoughts about the works that have long become classics. So, mineralogists, especially young ones, will be interested to reflect on the concepts of "paragenesis", "parasteresis" and "adjacency of minerals" together with the author.

Special gratitude must be expressed to the Digest editor for translating articles on about "feldspar" by Nils Zenzen and traveling to Russia and the Urals by an American scientist J. Kunz, foreign member of the Russian Mineralogical Society and an outstanding expert on precious stones.

The Digest will be interesting to a wide group of geologists, historians of science and students of geological sciences. It should be recommended to all admirers of natural history as a fascinating reading. It will undoubtedly help to "cherish people by their true value," as said in this book.
Contents:

Persons

Marin Y. B. - D. V. Rundkvist in Mineralogical Society.
Brodskaya R. L. - Full members of Mineralogical Society Yu.V. Kazitsyn and V.A. Cherepanov.
Malakhova I. G. - "The Gaidinger Effect" in Russia.
Malakhova I. G., Minina E. L. - So known P. Groth.
Potapov S. S. - Boris Valentinovich Chesnokov – Honorary Member of the Russian Mineralogical Society, Laureate of the Demidov Prize.
Silayev V. I., Martirosyan O. V., Trayvus E. B., Sukharev A. E. - "There are creatures who look at the sun directly, without closing their eyes".

Events

Voytekhovsky Yu.L. - To the 250th anniversary of the birth of A. von Humboldt and 190th anniversary of his travels in Russia.

Vtorov I. P. - Letter from E. V. Toll', Head of the Russian Polar Expedition. *Martirosyan O.V.* Negative amber or search for fossil resins in the Russian Arctic Putintseva E. V. Geological collections of N. M. Przhevalsky.

Texts

Voytekhovsky Yu.L.

To A.G. Werner's 270th anniversary.

To the 255th anniversary of Marble Breaks in Karelia.

To the 220th anniversary of the arrangement at the Miass Golden Dish Factory.

To the 220th anniversary of Vladimir Severgin's book "The First Foundations of Mineralogy or Natural History of Fossil Bodies" and the 170th anniversary of A. Breitgaupt's book "Paragenesis der Mineralien".

To the 190th anniversary of the Russian translation "Manual for Tests with Soldering Tube or Guidance on How to Determine with Precision Metal Content in Minerals and Their Products".

To the 185th anniversary of the training manuals "New rules for finding jumbled and displaced mineral deposits" and "Experience of the manual for ore use".

To the 130th anniversary of the essay "The Gems" by D. N. Mamin-Sibiryak.

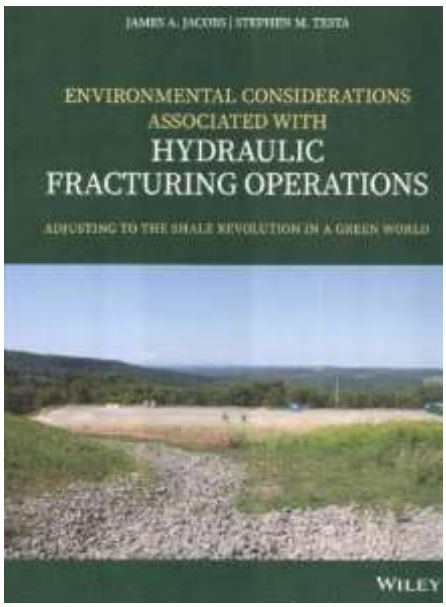
Translations to Russian

Censen N. On the first mention of the term "feldspar" by Daniel Tilas in 1740.

Kunz J.F. Travel to Russia and the Ural Mountains.

Nataliya I. Bryanchaninova, Geological Institute, Russian Academy of Sciences. Moscow, Russia

***Environmental Considerations Associated with Hydraulic Fracturing Operations; Adjusting to the Shale Revolution in a Green World*.** By James A. Jacobs and Stephen M. Testa; John Wiley & Sons, Inc., New York, 2019, 542 pp.
ISBN: 9781119336099[14]



This book was developed as a practical guide to help understand and mitigate adverse environmental impact by focusing on the side effects and unintended consequences of unconventional resource extraction and to facilitate the communication and education about the various processes, environmental aspects, safety issues, and risks involved with producing transporting, storing, and refining unconventional hydrocarbon resources. Foreword, p. xxxii.

Thus, the authors set out on their task, which is no small order, but one in which they succeed with flying colors. As this is such a comprehensive volume, with 16 chapters of varied subject matter - enhanced with almost 200 tables (including the appendices) and illustrated with over 200 images – to provide a good review it is necessary to have a look at each chapter individually.

Following the "Introduction," the first part of the book begins with the historical background. Chapter 2, "Historical Development from Fracturing to Hydraulic Fracturing," traces the development of the fracturing processes from the days of gun powder and nitro to horizontal drilling and hydraulic fracturing of rock, including attempts in the 1960s and 1970s to use a nuclear warhead to fracture the subsurface (see Sections 2.3 and 2.4). However, as hydraulic fracturing processes cannot be fully understood without at least some knowledge of the rock being fractured, Chapter 3, "Geology of Unconventional Resources," provides the reader with a geological overview of the major rocks types and various geological units that are currently targeted for hydraulic fracture treatment. Chapter 4, "Overview of Drilling and Hydraulic Fracture Stimulation Techniques for Tight Oil and Gas Shale Formations," takes the reader through some of the methods used in the fracturing processes; including reservoir evaluation and reserve estimations, with the mathematical equations used to determine such parameters as OOIP (Original Oil In Place) and OGIP (Original Gas In Place).

[14] Note this review was also published in *Oil-Industry History*, v. 20, no. 1, 2019, p. 79-81.

This is followed by an introduction to various drilling rigs and techniques and the geophysical techniques used to log and evaluate a prospective site. This chapter has a more in-depth look at directional drilling and the fracturing processes.

Then continuing with Chapter 5, "Overview of Impacts from Tight Oil and Shale Gas Resource Development," reviews the environmental aspects of these processes, which between 2010 and 2013 were used in approximately 275,000 wells in the United States (p. 137). The authors examine the role of fluids, both the initial fluid and the flow-back liquids, as well as air quality problems associated with the hydraulic fluid fracturing. But there is another fluid that must be considered and there is an entire chapter devoted to this in Chapter 6, "Surface and Groundwater Risks, Resource Quality Management and Impacts." This includes water acquisition and the mixing of the initial fluid with materials that dissolve into the fracturing fluid from the rock being fractured. This flow-back fluid has great potential for causing environmental issues if not handled properly which the authors describe, both in terms of what the potential problems are and how to mitigate situations that develop. One topic that has made national news headlines in the last few years is considered in Chapter 7, "Induced Seismicity." As the authors point out, while many of these events are the result of wastewater injection and not the actual fracturing process itself, this is an ongoing problem which must be considered.

Up to this point in the book, most everything discussed has been related to the sub-surface, or surface, such as streams and rivers, but in Chapter 8, "Air Quality Resources and Mitigation Measures," the authors take the readers into the very air we breathe and consider how air quality is affected by the process of extracting the hydrocarbons. They provide a discussion on how to minimize the negative effects, not only on the general public, but on worker exposure as well. One interesting, and a little unexpected, section deals with the matter of diesel exhausts from all the equipment associated with hydraulic fracturing. In this chapter there is a large section dealing with natural gas leaks, both natural and as a result of hydrocarbon recovery and especially from the transportation of oil and natural gas via pipelines. Even with leaks that are from natural sources, there is the danger of vapor intrusion from gas migrating into buildings and the authors have a section about this along with possible mitigation procedures[15].

In keeping with the above-ground conditions, there is Chapter 9, "Land Use Resources and Socioeconomics," in which the authors bring the reader in contact with concepts such as community planning and land disturbance, and discuss light pollution from a drill platform operating on a 24-hour schedule. Though this may be only temporary, it can still be quite a problem for people in the vicinity of the rig while it is happening. And as anyone knows who has been on a working drill rig, the noise can be overpowering. That sound then carries into the surrounding area which is a problem that must be addressed. The last part of this chapter examines the impact drilling projects have on the area in which they occur; primarily in the more rural regions of the country. These impacts can affect everything from the cost of housing to the extra demands put on a local school district, all of which the authors nicely lay out for the reader; including such topics as looking at the truck traffic through a community as a result of a drilling project. Just to handle the flow-back water removal for a single well can require 200 to 300 separate trips, and if the pad has multiple wells (as most do), then it might take as much as 2400 tanker truck trips through the community streets (Table 9.6, p. 277), a real problem for nearby residents. These are problems that must be addressed, and the authors do not hesitate to bring them to the readers' attention.

Chapter 10, "Ecological Resources," explores the impact of our hydrocarbon extraction on special environments like wetlands and agricultural resources, and even the impact of a drilling project on tourism in an area. Although a later chapter is devoted to oil spills, there is a section here looking at the impact of spills on the local habitats and ecological resources. Chapter 11, "Legislative Trends Associated with Well Stimulation and Hydraulic Fracturing," takes the reader into some of the political aspects related to the subject. Brief reviews are given of several Federal Acts which have a bearing on hydrocarbon removal, such as "Safe Drinking Water Act," and "The Clean Air Act." It is often said that all politics is local, so there are state and local regulations which have an effect as well. The authors discuss some of the state bans and moratoriums and how these affect the hydraulic fracturing and hydrocarbon removal. Chapter 12, "Sampling, Exposure Pathways, and Site Conceptual Models," examines interactions between various models of the interaction between hydrocarbon removal, transportation, processing, etc. and human health risks and environmental exposures, as well as various sampling techniques and monitoring.

No hydrocarbon removal projects can happen without affecting local real estate values and Chapter 13, "Financial Issues," considers this and other issues, not all of them negative. Take for example the aspect of royalty payments to the landowner on which a well is drilled. Even with a conservative production estimate for well pads on a 300-acre plot over the first-year period, a royalty payment, plus first-year bonus, could reach $1,538,750 (p. 353). This will not happen every year, but the rewards

[15] The author of this review had a gas ventilation system installed to prevent the natural radon migration from accumulating inside the lower portions of his home.

can be good for a very long time for some landowners. For example, most Marcellus Shale gas wells have an estimated lifetime of about 20-30 years of production (p. 353). Chapter 14, "Legal Consideration and Case Law," as the title implies, gives the reader a glimpse into the legal aspects of hydrocarbon removal, etc., in various states. As indicated earlier, oil spills are a major concern and Chapter 15, "Spills, Forensic Evaluation, and Case Studies," is devoted totally to this subject. One of the case studies is the accident of a train carrying Bakken crude oil from North Dakota which derailed and burned in November 2013 just south of Aliceville, Alabama. When there is what appears to be an anonymous spill, it is the forensic analysis techniques that allow investigators to determine the source of the spilled material; and the authors show how these various techniques work and how they are applied to oil spills. And finally, Chapter 16, "Conclusions," provides a nice summary of the previous 15 chapters.

Each chapter, except 16, includes a series of exercise questions suitable for classroom use, and each chapter has an extensive bibliography of both cited references and references for further reading on the chapter topic. Among the 11 appendices is a nice glossary (B) of terms used in the book and a list of acronyms and abbreviations (C). For non-metric users, there is a convenient metric conversion table (J). The index is quite comprehensive. For the most part the black and white illustrations are clear, but a few of them, such as Figure 4.4, would have benefitted from being in full color.

The authors are to be commended for producing such a well-researched and documented book; suitable, as they say in the Foreword, for "…students, regulators, environmental or resource geologist[s], and engineers…", as well as for anyone interested in the impact of hydrocarbon exploration, removal, and transportation. This very comprehensive book is a welcome addition as it provides a resource which will help replace assumptions and opinions with facts about hydraulic fracturing.

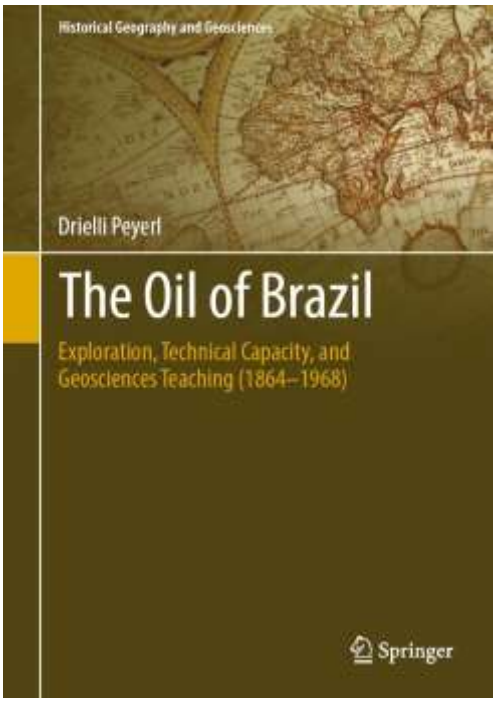
Reviewed by William R. Brice.

The Oil of Brazil: Exploration, Technical Capacity, and Geosciences Teaching (1864–1968)

By Drielli Peyerl, 2019, xxvi, 128 p. Springer Nature Switzerland AG, Gewerbestrasse11,6330Cham, Switzerland.
ISSN 2520-1379; ISSN 2520-1387 (electronic) Historical Geography and Geosciences
ISBN 978-3-030-13883-7; ISBN 978-3-030-13884-4 (eBook)
https://doi.org/10.1007/978-3-030-13884-4

Translation from the Portuguese language edition: *O Petróleo no Brasil; Exploraçã, Capacitação Técnica e Ensino de Geociências (1864-1968)* by Drielli Peyerl, © Editora Universidade Federal do ABC (EdUFABC) 2017.

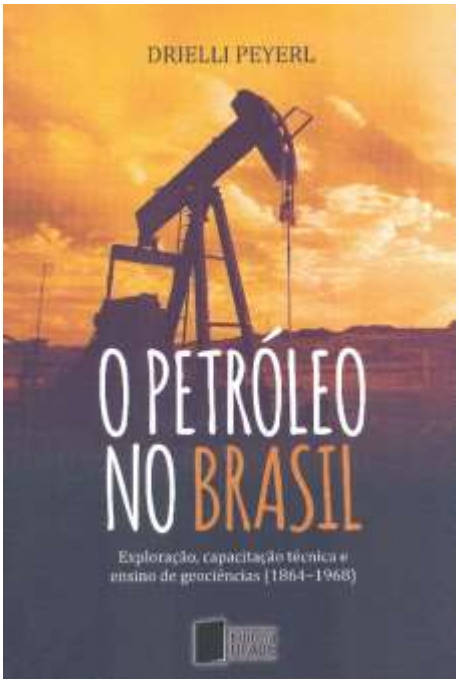
Brazil is yet another country that has a history with petroleum, and while that history is not as long as places in the Middle East or Europe, it does go back almost 200 years. People, especially in the United States, tend to forget that other locations were involved with petroleum before Mr. Drake and Uncle Billy Smith put down their hole in Western Pennsylvania in August of 1859. As Dr. Peyerl points out in her comprehensive book on the history of petroleum in Brazil, the people in that country were getting petroleum by drilling some five years before Mr. Drake:



It came up a Petroleum mass mixed with clay and sand, extracted from Taipú-mirim close to Barra de Camamú, less than 5 miles from the northwest of the Village and L. side of the river with the same name […]. With the aid of a drill it was reached, on November 1854, to 23 feet under the ground, always finding gravel with bituminous clay, also a vessel containing approximately three pounds of pure petroleum, extracted by distillation outdoor in piles or bins […]. By the stated this Petroleum is found, it deserves well the name they give, tar or pixe mineral […] (Petróleo 1855: 140) (Peyerl 2019, p. 7).

By late 1864, the word petroleum is found in official Brazilian documents and the first commercial petroleum activity had begun. Dr. Peyerl has carefully documented this growth and development. Another interesting aspect of this book is that the author relates the industrial development with the development of professional education and the relationship between the two; such as the creation of the School of Mines, founded in the end of 1875 and located in Ouro Preto, Minas Gerais State.

Dr. Peyerl starts the book, Chapter 1 "Introduction," with an outline of the historical aspects that she will emphasize for the reader which she has divided into three major time sections. In the first section, Chapter 2; The Petroleum Comes to Light (1864–1941), the reader is taken through the development from discovery up until the creation of the National Petroleum Council in 1938. During this time several geological surveys, both state and national, were created; all of which contributed to the petroleum industry through basic geological mapping and understanding of carbonaceous deposits.



In the second part, Chapter 3, "The Formation of the Know-How (1938–1961)," Dr. Peyerl documents the foreign influence in the Brazilian industry and how this changed the local industry landscape. She carefully outlines and leads the reader through the complicated relationship between the national political conditions and the developing industry. After the 1951 return to power by Getúlio Dornelles Vargas (by election this time), through the Law No. 2,004, dated October 3, 1953, he created the company *Petróleo Brasileira S. A.* (simply known as *Petrobras*). It was a mixed company with a hand in research, mining, refining, the trade and transportation of petroleum, and really any related activity – thus creating a National monopoly. It was this new company that bought the North American geologist Walter Karl Link (1902– 1982) to Brazil and he was to have a major effect on the Brazilian petroleum industry, especially in terms of exploration. Dr. Peyerl carefully explains the impact that he and other foreign experts had on the industry in Brazil.

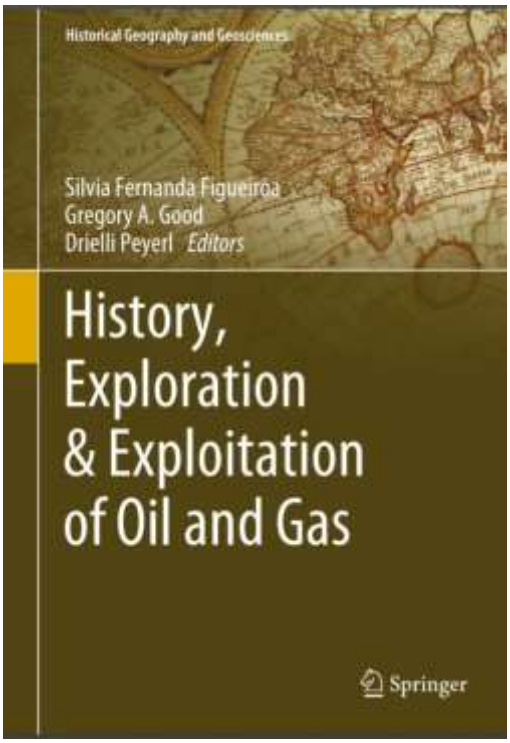
The third major section, Chapter 4, "Improvement, Professionalization, and Geosciences Teaching (1952–1968)," focuses on the improvement of the industry through the development of research centers and the improvement of local professional training for the petroleum workforce. Some of these improvements were through collaborative programs with universities, such as the "Petroleum Refining Course" developed through an agreement with the National School of Chemistry at the University of Brazil. This course was specifically designed to train professionals to work in the local refineries. Another example of changes in the training and education of the workforce was the "Oil Improvement and Research Center" (CENAP) created by Petrobras in1955. This organization had a comprehensive program designed to prepare specialized labor for the expansion, exploitation, and industrialization of the Brazilian oil reserves, so that the country was no longer dependent on foreign training. This was but one of several research centers that were created and detailed in the text.

Dr. Drielli Peyerl has certainly fulfilled the aim of this book, for as she says in Chapter 5, "Conclusion," *In fact, the purpose of this book was to describe and demonstrate the various paths taken in the search and exploitation of oil in Brazil. …* (p. 107). This she has done quite well. The book has many illustrations, graphs, tables, and charts that all add to the narrative and quite an extensive bibliography of both original and published sources. There are a few typographic errors, some found only in the English translation, such as on page 28 there is a reference to a "Charles Israel," whereas the Portuguese edition has the correct name, "Israel Charles White" (p. 71). However, on page 25 of the English version and, also, on page 65 of the Portuguese edition is the name "Henry Clay Folder." The last name should be "Folger." But these errors are few and do not detract from the overall quality of the work.

This very comprehensive volume is an excellent overall look at the development of the petroleum industry in Brazil and I highly recommend it to anyone who wishes to know the "hows," the "whys." and the "wherefores" of the Brazilian petroleum industry.

Reviewed by William R. Brice

History, Exploration & Exploitation of Oil and Gas, Edited by: Silvia Fernanda Figueirôa • Gregory A. Good • Drielli Peyerl. (2019), Springer Nature Switzerland AG, Gewerbestrasse 11, 6330 Cham, Switzerland, ix + 109 p.
ISSN 2520-1379 ISSN 2520-1387 (electronic) Historical Geography and Geosciences ISBN 978-3-030-13879-0 ISBN 978-3-030-13880-6 (eBook) https://doi.org/10.1007/978-3-030-13880-6.



This volume consists of papers from the symposium, *Black Gold: History, Exploration & Exploitation of Oil and Gas in National and International Contexts*, held in Rio de Janeiro, RJ, Brazil, in July 2017. The editors of the volume were also the organizers of the symposium. Although touching on topics in Europe and the United States, the majority (six of the nine articles) of the book's contents are devoted to oil and gas development in Brazil, which, in the opinion of the reviewer, adds to the importance of the volume, for that history is not as well known as it is in other parts of the world. Many of the articles are well illustrated and supported by various graphs, tables, and charts, but some of them would have benefited by the addition of a few illustrations.

The article related to the history in the United States is by Matthew Silverman, "Teapot Dome: The Greatest Political Scandal in the History of the US Oil Industry" (No. 5[16]), which was, as he says in the title, a very big political scandal from the 1920s. Many people know the name, "Teapot Dome," but really have no idea of the depth and extent of the corruption that was the "Teapot Dome." It was not the first, nor the last such political scandal in the U.S., but one of the largest, so far, involving the petroleum industry,[17] and this article explains both the technical aspects and the political side.

From the European perspective, Marianne Klemun contributed: "From Local to Global Petroleum Geology: Hans Höfer von Heimhalt's Contributions Between Empires, Economies and Epistemologies" (No. 1); and Martina Kölbl-Ebert takes the reader into the heart of the Cold War with, "From Colleague to Enemy? German Petroleum Geologists and the Cold War" (No. 7). Klemun nicely points out the parallels between the work of von Heimhalt in Europe with the activity of John F. Carll[18] in the oil fields of western Pennsylvania, with both men working at almost the same time. While Kölbl-Ebert transports the readers back to a time when geologists, in what was then East Germany, simply shared work with western colleagues and, "…found themselves charged with espionage and treason, facing imprisonment and potentially worse." (p. 71). The very heart of geology was essentially on trial and, due to the politics of the time, and "…geology was no longer regarded as a science, but was reduced to an industry providing mineral resources." (p. 78). It was, indeed, a very strange time when science was dictated by politics.

The bulk of the remaining articles are related to various topics in the origin and development of the petroleum industry in Brazil. Júlia C. T. Oliveira and Silvia F. de M. Figueirôa explore the development at the state level with, "History of Oil Exploration in the State of São Paulo Before the Foundation of Petrobras (1872–1953) (No. 2). Some of the earliest oil exploration took place in the State of São Paulo in 1872, and, also, as early as the 1890s, foreign geologists, such as the Belgian naturalist and engineer Auguste Collon (1869–1949), were coming to the State of São Paulo to assist in developing the local petroleum industry. This was continued in the 20th century when, in 1928, the North American petroleum geologist Chester Wesley Washburne (1883– 1971) was hired by Geographical and Geological Commission (CGG). Thus, well before the development of a national movement, there was activity at the state level.

The next two articles, "Petroleum: New Energy Perspectives for Brazil in 1922," by Maria Margaret Lopes (No. 3); and "Petroleum and Science: The National Petroleum Council and the Development of Oil Geology in Brazil, by Natascha de Vasconcellos Otoya (No. 4) describe the changes in the petroleum industry in Brazil that took place on the national level. It

[16] The numbers refer to the sequence in the contents; this is article number 5.
[17] For another view of the Teapot Dome scandal, see: Trabish, Herman K., 2005, Scandal: A Short History of the Teapot Dome Affair: *Oil-Industry History*, v. 6, no. 1, p. 101-121.
[18] For a closer look at the work of John Carll, see: Harper, John A., 2001, John F. Carll - The First Petroleum Geologist and Engineer: *The Oilfield Journal*, Winter 2001-2002, p. 2-14; also: http://www.oil150.com/essays/article?article_id=89.

should be noted, as mentioned by Maria Margaret Lopes, that in the 1920s, many people considered Brazil to be a country without oil, and most of the research was focused on coal mining, with petroleum only a peripheral consideration. Hence the big national push began with *The Primeiro Congresso Brasileiro de Carvãoe outros Combustíveis Nacionais* (Brazilian Congress of Coal and other National Fuels) held in Rio de Janeiro from October 28 to November 8, 1922, which did not even mention oil in the title, but, nevertheless, oil was an important part of the Congress. Natascha de Vasconcellos Otoya relates the continuation of this national movement with the creation of *The National Petroleum Council* in 1938. This organization was to have a twofold mission. First and foremost, it was to be a regulatory agency for the existing oil market and that included oil importers, the refineries, and the distribution system - down to the local gas stations. And it was to have a technical department responsible for the search for oil in all national territories. Later, much of this work was taken over by *Petrobras*, the State-controlled oil company founded in 1953. Giovanna G. Gielfi, explores the connections between Petrobras and the universities[19] in his paper "Research Partnership Between Petrobras and Brazilian Universities in the Transition to the Twenty-First Century." (No. 9).

Oil exploration needs tools with which to work and Drielli Peyerl and Elvio Pinto Bosetti show how micropaleontology has played a role in their article, "Technique and Exploration: The Beginning of Micropaleontology in the Brazilian Oil Industry." (No. 6). In Brazil, in the beginning, this work was carried out by three people; two foreigners, the Danish scientist, Johannes Christian Troelsen, and the German geologist and micropaleontologist Karl Krömmelbein; and one Brazilian, Frederico Waldemar Lange, who started developing the first studies on Brazilian microfossils in 1955. And in the latter part of the 20th century, this exploration moved into deep water, literally, as described by Edmilson Moutinho dos Santos and Drielli Peyerl in their article, "The Incredible Transforming History of a Former Oil Refiner into a Major Deepwater Offshore Operator: Blending Audacity, Technology, Policy, and Luck from the 1970s Oil Crisis up to the 2000s Pre-salt Discoveries" (No. 8). By the 1990s, wells were being brought in at records depths, *e.g.*, 1992, Marlin field production at a water depth of 781 meters (2561 ft), in 1994, also in the Marlin field, production at a water depth of 1027 meters (3368 ft), and by 1997 in the Marlim field, with a well producing at a depth of 2444 m (8018 ft).

This is a very nice collection of articles, mostly about various aspects of the history of the Brazilian petroleum industry, but the three non-Brazilian articles are of great interest as well, and the book is highly recommended to anyone with an interest in the changes that have taken place in the petroleum industry over the years, especially in Brazil.

Reviewed by William R. Brice.

[19] This topic is also explored in the book by Drielli Peyerl (2017) *O Petróleo no Brasil; Exploraçã, Capacitação Técnica e Ensino de Geociências (1864-1968)*, © Editora Universidade Federal do ABC (EdUFABC); English translation: *Oil of Brazil: Exploration, Technical Capacity, and Geosciences Teaching (1864–1968)*, 2019, xxvi, 128 p. Springer Nature Switzerland AG, Gewerbestrasse11, 6330 Cham, Switzerland.

COUNTRY REPORTS FOR 2019

Editor's Note: Due to the world-wide COVID-19 situation, some country reports may be incomplete for 2019. Any that are missing from this issue of the *INHIGEO Record* will be included in the report for 2020.

ARGENTINA

2019-2020 activities

In Argentina the most important activity on the history of geology during 2019 was the Vth Congress on the History of Argentinean Geology, held in the National Academy of Sciences (Córdoba, Argentina, September 12th-13th, 2019). The Congress was organized by G. Albanesi (Cordoba National University) and several INHIGEO members participated.

Thirty presentations of different scope, listed below, were given covering different historical subjects. They will be included in a special volume to be published during 2020 in the *Revista de la Facultad de Ciencias Exactas, Físicas y Naturales*, Universidad Nacional de Córdoba.

Aceñolaza, F. G., Abel Peirano y el desarrollo geológico del noroeste argentino.
Aguirre Urreta, B., Mescua, J. F., Vennari, V. & Ramos, V. A., Tras los pasos de Carl E. Burckhardt en los Andes mendocinos.
Albanesi, G. L., Sfragulla, J. A. & Carignano, C. A., Modelos geológicos en la historia temprana de las ciencias en Córdoba, Argentina, y sus alcances actuales.
Alonso, R. N., Historia de los boratos y el litio en Argentina.
Alvarez, J. A. & Noriega, J., Historia del Departamento Regional Centro de la Comisión Nacional de Energía Atómica. Breve reseña de los hitos académicos previos y el contexto mundial para la época de su creación.
Arguello, G. L. & Sacchi, G. A., Nuevas aristas del perfil de Anselmo Windhausen.
Calegari, R. G., Historia de la exploración del petróleo en la provincia de San Juan.
Carbone, G. B., Vergani, G. & Giusiano, A., Ciclos exploratorios: no convencionales, planificación y después.
Carbone, G. B., Vergani, G. & Giusiano, A., Neuquén, a un siglo del descubrimiento del petróleo. ¿Por qué fue estatal?
Carrasquero, S., El viaje de Walter Schiller a Brasil en 1912.
Ciccioli, S. E., La geología de Misiones según el informe inédito de CARTA.
Cioccale, M. A. & Pleitavino, M., Joaquín Camaño y Bazán (1737-1820): su aporte a la interpretación de los procesos geomorfológicos de la región central de la Argentina,
Cingolani, C. A., El geólogo naturalista Arnold Heim (1882-1965): primer Miembro Correspondiente de la Sociedad Geológica Argentina.
González Patagua, S. A., Colecciones históricas de fines del siglo XIX y principios del siglo XX en el museo Dr. Saturnino Iglesias, Jujuy.
Hervé, F. & Charrier, R., Louis Agassiz en Argentina y Chile: una historia poco conocida.
Martino, R. D., Josefa Vicenta Giambastiani de Peláez (1891-1974): primera doctora en geología y mineralogía de la Escuela de Ciencias Naturales (1931), *Facultad de Ciencias Exactas, Físicas y Naturales* (1876), de la Universidad Nacional de Córdoba (1613).
Ottone, E. G., Bonpland y los bivalvos fósiles de la bajada.
Ottone, E. G., La geología de Théodore Pavie.
Page, R. F. N., Un siglo de vaivenes políticos e ideológicos en el área geológica-minera del gobierno nacional.
Ramos, V. A., El primer estudio geológico de las Provincias Unidas del Rio de La Plata: los aportes de Dámaso A. Larrañaga.
Ramos, V. A. & Alonso, R., Thaddaeus Haenke: naturalista de la expedición de Malaspina.
Ramos, V. A. & Martino, R. D., El nacimiento de la geología en la enseñanza universitaria.
Riccardi, A. C., Bailey Willis: un geólogo yanqui y el desarrollo del norte de la Patagonia.
Riccardi, A. C., Telasco Garcia Castellanos: promotor de la Geología y de las ciencias.
Riccardi, A. C. Historiadores de la Geología Argentina.
Sacchi, G. A. & Arguello, G. L., Evolución de la pedología y su relación con la geología.
Selles-Martínez, J., El mesón de fierro en la cartografía de los siglos XVI a XIX.

Selles-Martínez, J., En el centenario de la publicación "La Sierra Baya, estudio geológico y económico" por Juan José Nágera.

Sfragulla, J. A., Lira, R. & Espeche, M.J., Litargirio y Plomo (±Ag) en la mina La Argentina, Departamento Minas, Córdoba: aporte de la mineralogía a la metalúrgica extractiva de mediados del siglo XIX.

Spalletti, L. A., Panorama sobre el desarrollo de la sedimentología en la Argentina.

In addition, different papers, mostly in Spanish, were published, some of which are listed below

Ricardo N. Alonso

Books

Alonso, R. N., 2019. Historias de Salta. Naturaleza y cultura. Hombre y paisaje, Personas y personalidades. Viajeros y sabios. Pp. 236. Mundo Gráfico, Salta Editorial, Salta.

Alonso, R, N, 2019, Historia de la vida antigua. La búsqueda del Antroposaurio. Ensayos sobre temas paleontologicos. Pp. 136. Mundo Gráfico, Salta Editorial, Salta.

Alonso, R, N, 2019, Historia Natural y Cultural. De la Piedra al Ununoctio. Pp. 200. Mundo Gráfico, Salta Editorial, Salta.

Chapters

Alonso, R. N., 2019. Cateadores, amparadores y mitos mineros. Centro de Investigaciones Genealógicas de Salta. Publicación Institucional Número 12: 263-280.

Papers

Ramos, V. A. & Alonso, R., 2018. Tadeo Haenke: Primer naturalista del virreinato del Rio de la Plata. Academia Nacional de Ciencias Exactas, Físicas y Naturales, Anales, 70: 117-147.

Tchoumatchenco, P., Riccardi, A., †Durand Delga, M., Alonso, R., Wiasemsky, M., Boltovskoy, D., Charrier, R. & Minina, E., 2018. Geologists of Russian origin in Latin America. Revista del Museo de La Plata, 3(2): 223-295.

Abstracts

Alonso, R. N., Historia de los boratos y el litio en Argentina. V Congreso Argentino de Historia de la Geología, La Geología en el Sesquicentenario de la Academia Nacional de Ciencias, Córdoba, September 12-13. Academia Nacional de Ciencias, Miscelánea 107: 12-14.

Alberto C. Riccardi

Books

Riccardi, A. C., 2019. *Ideario de Francisco P. Moreno*. Colección Idearios Argentinos, 5. Pp. 1-501. Fundación Museo de La Plata Francisco P. Moreno, La Plata; Fundación Banco de San Juan, San Juan.

Papers

Riccardi, A. C., 2019. El Perito Moreno, hacedor de las fronteras de la patria. Todo es Historia, 620: 6-23.

Abstracts

Riccardi, A. C., 2019. Historiadores de la Geología Argentina. V Congreso Argentino de Historia de la Geología, La Geología en el Sesquicentenario de la Academia Nacional de Ciencias, Córdoba, Septiembre 12-13. Academia Nacional de Ciencias, Miscelánea 107: 17.

Riccardi, A. C., 2019. Bailey Willis: un geólogo Yanqui y el desarrollo del norte de la Patagonia. V Congreso Argentino de Historia de la Geología, La Geología en el Sesquicentenario de la Academia Nacional de Ciencias, Córdoba, Septiembre 12-13. Academia Nacional de Ciencias, Miscelánea 107: 79-80.

Riccardi, A. C., 2019. Telasco García Castellanos: promotor de la Geología y de las Ciencias. V Congreso Argentino de Historia de la Geología, La Geología en el Sesquicentenario de la Academia Nacional de Ciencias, Córdoba, Septiembre 12-13. Academia Nacional de Ciencias, Miscelánea 107: 81-82.

Information submitted by **A. C. Riccardi** on behalf of the Argentinean Commission on the History of Geology.

ARMENIA

ANNUAL REPORT 2019

G. Malkhasyan prepared article devoted to the scientific and pedagogical activities of a great geophysicist, one of the founders of the geophysical school in Armenia – G. M. Vantsyan. The article was devoted to the 100th birthday of G. M. Vantsyan. Researches were continued on the archive materials related to the geological study of the territory of Nagorno-Karabakh Republic, in order to create a catalogue of works about NKR. Studies on biography and scientific-pedagogical activity of the first head of the geological survey in Armenia, G. M. Harutyunyan, were started and are being finalized.

G. Khomizuri completed the fundamental research *Terror against geologists and miners in the USSR (1917-1988)* which he began in 2006. The analysis of the data of 1800 geologists and miners subjected to terror showed that the communists followed the directive formulated 500 years before the October Revolution by the founder of Utopian socialism, Thomas More: "Particularly serious crimes are usually punishable by conviction for work. The inhabitants of Utopia believe that this is no less fear for criminals and more benefit for the state than if they began to rush to kill the perpetrators and get rid of them right away. They will bring more benefit by their labor rather than their death." A study showed that in the USSR 10% of arrested geologists and miners, as "enemies of the people" were shot and 70% were sentenced to forced labor. The study includes Appendices unique in their content. This study relates to both civil history and the history of geology, as upon the arrest of specialists in the field of geology and mining and especially world-class scientists (such as D. I. Mushketov, N. M. Fedorovsky, P. I. Palchinsky, A. K. Boldyrev, V. A. Zilbermints, I. F. Grigoriev et al.) were seized from libraries, and in many cases their works were destroyed, which caused an irreparable harm to the development of geology. Students were deprived from lectures and trainings by leading experts.

G. Khomizuri prepared and delivered a talk at the Museum after Alexander Spendiarov and Yerevan State University about a world-class mineralogist and crystallographer Andreas Artsruni and his brother, a prominent public figure in Armenia, Grigor.

Publications:

Malkhasyan G. Hrant Vantsyan // "Hayazg" Armenian Encyclopedia Foundation. 2019.
Malkhasyan E., Malkhasyan G., Khomizuri G. Bibliography on articles on history of geology of Armenia (1821-2017) // INHIGEO Newsletter. 2019. No 51 for 2018. Johnstown, Pennsylvania, USA. P. 149-160.
Khomizuri G. Terror against geologists and miners in USSR (1917-1988). 2019. 1260 p. **URL**

Submitted by **G. Khomizuri**, Yerevan (Armenia)
g.khomizuri@yandex.ru.

AUSTRIA

2019 Report

Marianne Klemun: Publications: 2 Books, 7 Articles (Peer Reviewed)
2 Symposia organised at Int. Conferences, given 8 lectures (mostly invited),
Radiobroadcasts in Austrian Broadcast about Leonardo Da Vinci and Alexander von Humboldt
Contributions for the E-Bulletin IUGS, "Anniversaries" 150♯, 151♯, 161♯

Books

Marianne Klemun, *Wissenschaft als Kommunikation in der Metropole Wien* [Science as Communication in the Metropolis Vienna]. Die Tagebücher Franz von Hauers der Jahre 1860-1868 [The Diaries of Franz Hauer, 1860-1868]. Böhlau: Wien/Köln/Weimar 2020

Marianne Klemun together with Anastasia Fedotova and Marina Loskutova (Eds.), *Skulls and Blossoms: Natural History Collections and their Meanings*. Centaurus. An International *Journal of the History of Science and its Cultural Aspects*, Special Issue, Vol. 60, Nr. 4 (2018), printed in 2019.

Articles in international and national Journals:

Marianne Klemun, Interwoven Functionalities between Empire and Science in the Habsburg Monarchy. A Comparison of Nineteenth Century Geology and Botany. In: Jan Arend (Ed.) *Science and Empire in Easter Europe, Imperial Russia and the Habsburg Monarchy in the 19th Century* (Böhlau: Wien/Köln/Weimar), 275-288

Marianne Klemun, The pride of Lippitzbach: multiple spaces of knowledge and meanings of the Amazon water lily, from the Amazon Basin to Carinthia (Austria). In: Martina Kaller and Frank Jacob (Eds.), *Transatlantic Trade and Global Cultural Transfers since 1492. More than Commodities*, (Routledge Studies in Modern History), Routledge: London New York 2020, 150–171.

Marianne Klemun together with Anastasia Fedotova and Marina Loskutova, Skulls and Blossoms: Collecting and the meaning of scientific objects as resources from the 18th to 20th century. Editorial. In: *Skulls and Blossoms: Natural History Collections and their Meanings*, Centaurus. An International Journal of the History of Science and its Cultural Aspects, Special Issue, Vol. 60, Nr. 4 (2018), printed in 2019, 231–237.

Marianne Klemun, From Local to Global: The Petroleum Geologist Hans Höfer von Heimhalt between Empires, Economies and Epistemologies. In: S. Figueirôa, G.A. Good and D. Peyerl (Eds.), *History, Exploration and Exploitation of Oil and Gas*, Springer 2019, S. 1–11.

Marianne Klemun, Bewegung statt Stillstand. Vergesellschaftung von Wissen und Natur im Vormärz in Kärnten. [Dynamics instead of Standstill. Societalisation of Knowledge and Nature in Carinthia during the Pre-March Period]. In: *Bulletin*. Sonderheft, 175 Jahre Geschichtsverein für Kärnten. Klagenfurt 2019, 167–171.

Marianne Klemun together with Mike Johnston, Looking back to the roots of INHIGEO: The inaugural and 50th anniversary meetings held in Yerevan in 1967 and 2017. In: *Episodes* Vol. 42, Nr. 1 (2019), 69–75.

Marianne Klemun, 'Indifferentismus' (ist) der Haupthemmschuh des Fortschritts. Relationen zwischen Franz Unger, Charles Darwin und Eduard Suess sowie die Lektüren von Darwins "Origin" im Wien der 1860er und 1870er Jahre. ["Indifferentism is the Obstacle of Progress": Relations between Franz Unger, Charles Darwin and Eduard Suess, as well the Reception of Darwin's "Origin" in Vienna during the 1860s and 1870s]; *In*: Herbert Matis, Wolfgang L. Reiter (Eds.), Darwin in Zentraleuropa (Wien 2018), 87–126.

Lectures and Conferences organized

Marianne Klemun, Fragmentiertes Natur-Wissen "in transit." [Fragmented Knowledge on Nature "in transit"] Bei: Das Wie[n]erische Diarium als Medium Habsburgischer Repräsentationsstrategien. [The Vienna Journal Diarium as a Medium of Habsburg Strategies of Representation] Workshop des Forschungsbereichs Kunstgeschichte am Institute für Habsburg and Balkan Studies. Österreichische Akademie der Wissenschaften, 28. Jänner 2020, Österreichische Akademie der Wissenschaften, Wien.

Marianne Klemun, Discutant (Podiumsdiskussion) at the Research Workshop. Habsburg Knowledge Initiative: Central Europe in Global History, together with Christine Lebeau (Paris), Kapil Raj (Paris), Bernhard Schär (Zürich), Jan Surman (Moskau), Werner Telesko (Wien) und Natascha Wheatley (Princeton), at: Empire of Circulation. Habsburg Knowledge in its Global Setting. International Conference, 9-11 October 2029, Austrian National Library, Picture Archives and Graphics Department, Vienna, 10 October 2019.

Marianne Klemun, Communicating Geology between Bureaucracy, Public, Society and Laymen: the Geological Survey in the Habsburg Monarchy and beyond, at: History of Communication in the Geological Sciences – 2, 44th INHIGEO Symposium, Varese and Como 2-12 September 2019.

Marianne Klemun, Organisation of the Symposium (together with Borbala Zsuzsana Török) "Resilience of Eighteenth-Century Science in the Habsburg Monarchy 1 and 2," (speakers: Mattes, Török, Chahrour, Kontler, Fillafer, Klemun), at: Enlightenment Identities, 15th International Congress on the Edinburgh 14-19 July 2019.

Marianne Klemun, Gathering Data and Objects without Travel Narration: Natural History Collections of the Habsburg Monarchy in Transition, at: "Resilience of Eighteenth-Century Science in the Habsburg Monarchy 1 and 1" (speakers: Mattes, Török, Chahrour, Kontler, Fillafer, Klemun), at: Enlightenment Identities, 15th International Congress on the 14-19 July 2019.

Marianne Klemun, Organisation of the Symposium (together with Johannes Mattes) "Mapping Communication between Naturalists", at Scientiae, Queens's University Belfast, June 12-15, 2019.

Marianne Klemun, Entangled special and epistemic categories in the cooperation between naturalists, at: "Mapping Communication between Naturalists", org. by Mattes and Klemun, at Scientiae, Queens's University ", June 12-15, 2019.

Marianne Klemun, Nikolaus Joseph Jacquin (1727–1817): Ein Naturforscher (er)findet sich. [N. J. Jacquin: A naturalist re-invents himself]bei: Seminar org. von Prof. Fischer und mit dem Verein Flora Österreich, am Rennweg der Universität Wien, 14. März 2019, Universität Wien.

Anniversaries at E-Bulletion of the IUGS online

Leonardo da Vinci and his possible contribution to geology 500 years ago, 150 ♯

Alexander von Humboldt: "Unkelstein" in the Rhine River, Basalt and the Pyramids – A Strange Connection 250 years ago, 151 ♯

The Geological Survey in Vienna: Imperial geology 170 years ago, 161 ♯

Johannes Mattes has, in 2019, published one monograph and one scientific paper:

J. Mattes, *Wissenskulturen des Subterranen. Vermittler im Spannungsfeld zwischen Wissenschaft und Öffentlichkeit. Ein biografisches Lexikon*. Vienna, Cologne, Weimar: Böhlau 2018, 572 pp.

J. Mattes, Entre nature et culture: les grottes, cabinets de curiosités naturelles à l'époque moderne (traduit par Claudine Cohen, EHESS, Paris). In: *Communications* 105(2), 2019, p. 13–26.

Further, Mattes has prepared 6 papers for publication that are currently under review.

Mattes gave 6 oral presentations, 1 comment and co-organized 1 session within the following international conferences/lecture series:

National Spaces & Deepest Places. Politics and Practices of Verticality in the Scientific Research of Caves. Conference of the Canadian Society for the History and Philosophy of Sciences, University of British Columbia (Vancouver 5/2019).

Working Report. Workshop on Verticality in the History of Sciences, Max-Plank-Institute for the History of Sciences (Berlin 6/2019).

Comment & Co-Organizer of the Session *Mapping Communication between Naturalists*. Scientiae – Disciplines of Knowing in the Early Modern World, Queen's University Belfast (Belfast 6/2019).

Accelerating or Braking – Spatial Dynamics & Control in the Organization of Scientific Societies in Vienna (late 18th and early 19th century). ISECS International Congress on the Enlightenment, University of Edinburgh (Edinburgh 7/2019).

Communicating between Research and the Public. The Role of Earth Sciences & (Popular) Scientific Societies for the Distribution of Knowledge in 19th-century Vienna. 44th INHIGEO Symposium, Università degli Studi dell'Insubria (Varese 9/2019).

Wissenskulturen des Subterranen. Book Presentation, Austrian Academy of Sciences (Vienna 10/2019).

Von Höhlenbären, Beutetieren und Schattenpflanzen: Erzähl- und Karrieremuster der Erdwissenschaftlerinnen Elise Hofmann und Maria Mottl. Annual Conference of the Ignaz-Lieben-Society (Vienna 11/2019).

Matthias Svojtka – In 2019 Matthias authored 10 biographies of natural scientists for part 70 of the *Austrian Biographical Dictionary* and 13 biographies for the (online published) second edition of the *Austrian Biographical Dictionary* (part 8, December 10th), which including inter alia the palaeontologist Karl Adolf Bachofen von Echt (1864-1947) and the famous naturalists Gustav Weindorfer (1874-1932) and Friedrich Welwitsch (1806-1872).

ORCID: Matthias Svojtka, http://orcid.org/0000-0001-7511-3964

Publications:

Svojtka, M. 2019: Weindorfer Gustav. Österreichisches Biographisches Lexikon 1815-1950, 70. Lfg., S. 63 (ISBN 978-3-7001-8610-6).

Svojtka, M. 2019: Welwitsch Friedrich. Österreichisches Biographisches Lexikon 1815-1950, 70. Lfg., S. 112-113 (ISBN 978-3-7001-8610-6).

Svojtka, M. 2019: Bachofen von Echt Adolf Karl Freiherr. Österreichisches Biographisches Lexikon ab 1815 (2nd ed. – online), Lfg. 8, 10.12.2018 (ISBN 978-3-7001-3213-4).

AUSTRALIA

INHIGEO 2019 Annual Report

William Birch: I continued to work on transcribing Edward Dunn's diary (see last year's report) but only intermittently. My main project for the year has been tracing the history of a unique iron-nickel meteorite, Wedderburn, from central Victoria. After it was lodged in the collection of the Geological Survey of Victoria in 1951, pieces were distributed to major institutions in Europe and North America, where leading researchers have investigated its unusual chemistry, mineralogy and microtexture in great detail. The recent approval of a new iron carbide mineral named edscottite, with the formula Fe_3C_2, in Wedderburn, prompted me to review its history, from its discovery to its current classification status. In a related study, I have discovered that the published find-site of the Ellerslie meteorite, the main mass of which is in Museum Victoria's collection, has been wrongly assigned to Queensland, rather than New South Wales. A paper to correct this error is currently in preparation.

Publication since last report

Birch, W. D., 2019. The Wedderburn Meteorite revisited. *Proceedings of the Royal Society of Victoria* 131(2): 74-83.doi: 10.1071/RS19010.

Barry Cooper has continued as INHIGEO President during 2019 with anticipation of "passing the baton" to Ezio Vaccari (Italy) in early 2020.

Regrettably, in early 2020, the election of the INHIGEO Board 2020-2024 was delayed by postponement of the 36th International Geological Congress in anticipation of the international spread of the life-threatening coronavirus.

Historical papers and abstracts published during 2019:

· Solnhofener Plattenkalk: a heritage stone of international significance from Germany. Geological *Society of London, Special Publications*, 486 https://doi.org/10.1144/SP486-2017-324 (with M.Kölbl-Ebert)

· Heritage stone in South Australia. *Australian Journal of Earth Sciences* 66 (6): p. 947-953

· Geological maps from South Australia: Their fundamental historic role in communicating geological information. *Abstracts 44th INHIGEO Symposium, Varese – Como, Italy, 2-12 September 2019.*

· The Candoglia Marble and the "Veneranda Fabbrica del Duomo di Milano": A Renowned Georesource to be potentially designed as a Global Heritage Stone. *Sustainability* 11 (13 pages) (with G. A. Dino, A. Borghi, D. Castelli, F. Canali, and E. Corbetta.

Barry was also an ongoing co-editor of the volume "Global Heritage Stone: Worldwide Examples of Heritage Stones" initially published online as *Special Publications 486, Geological Society of London.*

Ken McQueen was active in the areas of geological heritage and education through his membership of the Steering Committee for the Australian National Rock Garden and the Heritage Committee of the ACT Branch of the Geological Society of Australia. He continued as a member of the Earth Sciences History Group of the GSA. Ken was also active in mining history and heritage through the Australasian Mining History Association (AMHA), maintaining the AMHA website and serving on the Advisory Committee and editorial board of JAMH. In July he attended the 25th annual conference of the AMHA, held in Atherton, north Queensland, presenting two papers and participating in field trips to historic mining sites and geological features in the region. During the year he made separate trips to northwest Queensland and to the Eyre Peninsula, South Australia, where he had the opportunity to visit geoheritage and mining heritage sites, including the dinosaur museum and trackways at Winton, the historic Croydon goldfield, Mount Isa mineral field and the unique geological features at Cape Carnot, Murphy's Haystacks and Head of Bight.

Publications and conference publications

McQueen, K.G., 2019. Cangai copper: history of a 'good little earner'. *Journal of Australasian Mining History*, 17, pp.

McQueen, K.G., 2019. Girilambone copper: How new technology can make a world of difference. *In*: Wegner, J., Elwood, G. and McQueen, K. (eds), *In the Footsteps of Moffat*, Proceedings of the 25th Annual Conference, AMHA, Atherton, Queensland, 7-14 July 2019, p. 33.

McQueen, E.M. and McQueen, K.G., 2019. Pauline Catherine Speckhardt: The 'Lady Miner of Kingsgate' NSW. *In*: Wegner, J., Elwood, G. and McQueen, K. (eds), *In the Footsteps of Moffat*, Proceedings of the 25th Annual Conference, AMHA, Atherton, Queensland, 7-14 July 2019, p. 32.

Wegner, J., Elwood, G. and McQueen, K. (eds), 2019. *In the Footsteps of Moffat*, Proceedings of the 25th Annual Conference, AMHA, Atherton, Queensland, 7-14 July 2019, 55 pp.

McQueen, K., 2019. National Rock Garden News – Adelong Norite unveiled and a small piece of Antarctica on its way to the NRG. *AIG News*, No. 136, pp. 50-52.

McQueen, K., 2019. National Rock Garden – Antarctic rocks on the way. *The Australian Geologist*, 191, pp. 21-22.

McQueen, K., 2019. The Mawson Charnockite: a small piece of Antarctica for the National Rock Garden. *National Rock Garden Newsletter* No. 17. www.nationalrockgarden.org.au.

Susan Turner: For the last 2.5 years I have been working on a book on the history of women in vertebrate paleontology due to be published by Johns Hopkins University Press in October 2020. This volume will consider individual women from the late 18th century to the present day, as well as gender disparity in their career tracks and the development of the Society of Vertebrate Paleontology, as well as VP conferences and VP education worldwide as they affect women. As part of this work she is compiling detailed chronologies of many of the 1900 plus women now 'discovered'.

In addition she has prepared an essay on women paleoartists for the Geological Society of America Special Memoir The *Evolution of Paleontological Art* edited by Renee M. Clary, Gary D. Rosenberg, and Dallas Evans; these two ventures are undertaken with Prof. Annalisa Berta of San Diego. In 0ctober 2018 Annalisa undertook the interviewing and videotaping of around 20 living women which will be part of the online presence with the book.

On 21 May 2019, Sue took part in the 100 Years celebration of women becoming Fellows of the Geological Society, London with a talk on 'Far-flung (and bone-hunting) female Fellows. In 2020 an essay on this theme has been refereed for the upcoming GSL Special Publication edited by Cynthia Burek and Bettie Higgs. Work continues on databasing women geoscientists (in Felimaker Pro), and she added a project on women in VP to ResearchGate. Sue continues to maintain the Facebook page 'Women in Geoscience', which she created, as well as other pages mentioned previously.

Sue has also been working with Dr. Oleg Lebedev (PIN, Moscow) on the history of Palaeozoic fossil fish collecting, cooperating on both the women (*e.g.* the late Dr. Elga Mark-Kurik) and men (L. Beverly Halstead aka Tarlo). She is also preparing essays on the late Professor Hakuyu Okada for the Geological Society, London and has submitted on Mary Wade and Erik Stensiö for a planned 'Planet Earth' book on palaeontologists edited by Dr John Talent (Sydney).

Publications

2018

Turner, Susan with H-P. Schultze & Michael Newman 2018. Elga MARK-KURIK (26.12.1928-6.11.2016). Devonian Publications. *In*: Becker, RT ed. SDS Newsletter no. 33, 12-19.

Turner, Susan, & BERTA, Annalisa, 2018. "Bone Hunters" ‐ The History of Women in Vertebrate Paleontology Book Project. Poster for Education and Outreach, 78th SVP Albuquerque Oct 17-21, 2018, Journal of Vertebrate Paleontology Supplement, abstract (for poster).

2019

Turner, S. 2019. Far-flung Female (and Bone-hunting) Fellows. *In*: Burek & Higgs eds. Conference to Celebrate the Centenary of the First Female Fellows of the Geological Society London. May 21, 2019, History of Geology Group, The Geological Society & University College Cork, Ireland, abstracts, 1 p.

Turner, S., Berta, A., 2019. "Bone Hunters" Project – Australasian Women; *In* Vertebrate Paleontology. 79th SVP Brisbane Education and Outreach Poster Session (Wednesday - Saturday, October 9-12, 2019, October Program & Abstracts, p. 209.

2020

Berta, A. and Turner, S. in press. *Rebels, Scholars and Explorers: Women in Vertebrate Paleontology*. Johns Hopkins University Press, Baltimore. [Oct 2020].

Turner, S. 2020 in press. Far flung Female (and fossil bone hunting) Fellows: an autoethnographic approach. *In*: Burek, C & Higgs, B. eds. Uncovering the historical contribution of women in the Geosciences: Celebrations of first female fellows of GSL. Geological Society London Special Publications.

Brazil

2019 was a year of much activity and academic production in History of Geology in Brazil. At the beginning of the year, the book *History, Exploration & Exploitation of Oil and Gas* was published by Springer, organized by **Silvia F. de M. Figueirôa,** Gregory Good, and **Drielli Peyerl** (see a review in this issue). Besides articles by Marianne Klemun, Martina Kölbl-Ebert, and other collaborators, many of them INHIGEO members, the book organizers and **Maria Margaret Lopes** have also published chapters on specific aspects of the history of oil exploration in Brazil, covering from the end of the 19th century up to the 2000s Pre-salt discoveries. The book includes most of the papers presented in the INHIGEO "Symposium Black Gold: History, Exploration & Exploitation of Oil and Gas" in national and international contexts, which took place during the 25th International Congress of History of Science and Technology (Rio de Janeiro, Brazil, July 2017).

Silvia Figueirôa was elected Corresponding Member of the International Academy of the History of Sciences (IAHS), and **Maria Margaret Lopes** was nominated for the vice-presidency of Latin America at the INHIGEO Varese meeting, nomination to be confirmed at the INHIGEO meeting in New Delhi. The two researchers were invited to prepare a paper on Disasters for the FOCUS section of *ISIS* - Journal of History of Science. The article 'The History of Geology Meets Disasters: A Brazilian Perspective' dealing with the history of earthquakes in the country has just been published in March of the current year (2020). The two researchers also launched the organizations of the symposium entitled 'History of Geological Sciences: knowledge and practices, agencies, agents and networks' (ST23 - https://www.17snhct.sbhc.org.br/simposio/view?ID_SIMPOSIO=147) to be held within the 17th National Seminar on the History of Science and Technology (postponed to September 2020). Amongst the 11 registered participants are INHIGEO members **Drielli Peyerl** and the new colleague from Argentina, Mariana Waligora.

Silvia Figueirôa and **Margaret Lopes** participated in INHIGEO, Varese-Como, presenting papers related to their ongoing research projects that count with the support of the National Research Council - CNPq. Their projects are respectively -Nerée Boubée (1806-1862), her books and Brazil: open connections (2018-2022), and Paleontological research: basis for the search for oil in Brazil (1907-1940) (2019-2023). **Drielli Peyerl**, who participates in the "Environmental and social impact assessment for CO2 storage activities Project" at the University of São Paulo, also got her own project "Transitions in Energy History: development and new perspectives about the natural gas in Brazil" financed by the Fundação de Amparo à Pesquisa do Estado de São Paulo - FAPESP (2019-2021). In 2019, her book, *O Petróleo no Brasil; Exploraçã, Capacitação Técnica e Ensino de Geociências (1864-1968)* (2017), was published in an English edition, *The Oil of Brazil: Exploration, Technical Capacity, and Geosciences Teaching (1864–1968)* (see a review in this issue).

Related to these projects, the authors and their collaborators, as well as other Brazilian INHIGEO members, published, among others, the following works.

BARBOSA, Tércio A. P.; FIGUEIRÔA, Silvia F. de Mendonça. History of Science and experimentation in the study of living beings in middle school. In: *Proceedings of the 15th International History, Philosophy and Science Teaching Conference IHPST 2019*. Thessaloniki: Grafima Publications, 2019. p. 199-206.

BEZERRA, G.; LAZZARO, D.; PEIXOTO, A.; LOPES, Maria Margaret; BARBOSA Márcia C. Female Researchers in Science in Brazil: The Scissors Effect. *In*: Lilia Meza MONTES; Silvina Ponce DAWSON. (Org.). *La Brecha de Género en matemática, Computación y Ciencias Naturales. Un Abordaje desde América Latina*. Ciudad de Mexico: Sociedad Mexicana de Física, 2019, v. 1, p. 55-67.

BOCCHI, L. A.; PATACA, E. M. Frederico Carlos Hoehne e o Horto Oswaldo Cruz. DESENVOLVIMENTO E MEIO AMBIENTE (UFPR), v. 1, p. 350-369, 2019.

FIGUEIRÔA, Silvia Fernanda de M.; GOOD, G. (Org.) PEYERL, Drielli (Org.). *History, Exploration & Exploitation of Oil and Gas.* 1. ed. Springer, 2019. 109p.

FIGUEIRÔA, Silvia Fernanda de Mendonça (coord.) *História e filosofia das ciências da natureza e da matemática: ensino, pesquisa e formação de professores*. São Paulo: Hipótese, 2019. 338p.

FIGUEIRÔA, Silvia Fernanda de Mendonça. Nerée Boubée (1806-1862), an activist for communication in the geological sciences. *In*: *Abstracts of the 44th International Symposium on the History of Geological Sciences*. Varese: Università degli Studi dell' Insubria, 2019. p. 74-75.

GOMES, Ana Lúcia de Abreu; LOPES, Maria Margaret. O processo de tombamento da primeira sede do Museu Nacional na atual Praça da República - Rio de Janeiro. TEMPO (NITERÓI. ONLINE), v. 25, p. 647-666, 2019. https://doi.org/10.1590/tem-1980-542x2019v250306

LOPES, Maria Margaret. Paleontology for Oil. The Brazilian Geological and Mineralogical Survey's works, in the first decades of the 20th century. In: *Program and Book of Abstracts 44th INHIGEO Symposium*. Varese: Università degli Studi dell'Insubria, 2019. p. 71-72.

LOPES, Maria Margaret. Petroleum: New Energy Perspectives for Brazil in 1922. *In*: FIGUEIRÔA, S. F. de M; GOOD, G. A.; PEYERL D. (Org.). *History, Exploration & Exploitation of Oil and Gas*. 1a.ed.Cham: Springer International Publishing, 2019, v., p. 25-36.

MARINHO, C.; MIGUEL, G. F.; SIMAS, J. L.; GONÇALVES, PEDRO WAGNER. Elementos da História e Filosofia das Ciências em livros didáticos de Geologia: uma análise temporal. REVISTA TERRAE DIDATICA, v. 15, p. 1-16, 2019.

MARKO, G.; PATACA, E. M. Concepções de ciência e educação: contribuições da história da ciência na formação de professores. Educação e Pesquisa (USP. Impresso), v. 45, p. 186743, 2019.

MASCARENHAS, K. L.; PEYERL, Drielli; et al. Challenges for the Implementation of Carbon Capture and Storage (Ccs) in Brazil: A Socio-Technical Approach. *Polytechnica*, v. 2, p. 1-8, 2019.

MOUETTE, D.; PEYERL, Drielli et al. Costs and emissions assessment of a Blue Corridor in a Brazilian reality: The use of liquefied natural gas in the transport sector. *Science of the Total Environment*, v. 668, p. 1104-1116, 2019.

MOUTINHO DOS SANTOS, E.; PEYERL, Drielli. The incredible transforming history of a former oil refiner into a major deep water offshore operator: blending audacity, technology, policy, and luck, from the 1970s Oil crises up to the 2000s Pre-Salt discoveries. *In:* Silvia FIGUEIRÔA, Gregory GOOD, Drielli PEYERL. (Org.). *History, Exploration, and Exploitation of Oil and Gas.* 1ed.: Springer, 2019, v. 1, p. 87-100.

OLIVEIRA, J. C. T.; FIGUEIRÔA, Silvia Fernanda de Mendonça. History of Oil Exploration in the State of São Paulo Before the Foundation of Petrobras (1872?1953). *In*: FIGUEIRÔA S.; GOOD G.; PEYERL D. (Org.). *History, Exploration & Exploitation of Oil and Gas*. 1ed.Genebra: Springer, 2019, v. 1, p. 13-24.

PATACA, E. M. e LUNA, F. J. (Org.) *Frei Veloso e a Tipografia do Arco do Cego*. São Paulo: Editora da Universidade de São Paulo, 2019, 448p.

PEREIRA, Elisabete Jesus dos Santos; LOPES, Maria Margaret; NUNES, Maria de Fátima. `Collective wisdom' at the National Archaeological Museum in Portugal. *Museum History Journal*, v. 12, p. 171-191, 2019.

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Maria Margaret Lopes and Silvia Fernanda de Mendonça Figueirôa

CANADA

Ernie Hamm

The highlight of my INHIGEO related activities in 2019 was participating in our Commission's annual Symposium, which was held in the always elegant and occasionally sumptuous venues of Varese, Como and the Visconti of San Vito Castle, and the associated field trips in Turin and numerous locales in Lombardy and its environs. My paper, "Mountains and the Construction and Formation of the Earth: Leopold von Buch as Naturalist and Geologist," sought to build on the insights of Bernhard Fritscher, who presented von Buch as someone steeped in the mining traditions of Freiberg who was equally at home among English gentlemanly geologists. Through a consideration of a series of representative works of Buch, I proposed he was also very much a part of another tradition, one that searched for foundational principles and laws for a science, and that was evident in the French naturalists and geologists that he so admired. Buch's career reached well into what is often called an age of European nationalism, but his geognosy and geology was very much a transnational activity.

As is always the case at INHIGEO Symposia, the lively and friendly exchange of ideas never stops at the lecture hall, it carries on over meals, on bus rides, and on hikes. Our hosts were fonts of knowledge of the region's culture, history and geology. To give but one example, it was a pleasure listening to Ezio Vaccari telling us of the Ragni di Lecco (the spiders of Lecco), an extraordinary group of climbers and mountaineers from the town of Lecco, where we had come to see the Piani Resinelli Mining Park. After the close of the Symposium and field trips it was great to spend a few days hiking in the Dolomites together with Andrea Candela, one of the Symposium organizers and an excellent guide to the spectacular range of mountains that were so centrally important to von Buch and so many other geologists.

In June, I presented "A Mountain, Romantics and a Nation: Science and the First Ascent of Mt. Ararat," a paper for the annual meeting of the Canadian Society for the History and Philosophy of Science (CSHPS), which was held at the University of British Columbia in Vancouver. This paper, which showed that Friedrich Parrot's 1829 expedition to climb Mt. Ararat was rife with deeply interconnected cultural, historical and scientific relations, was part of a session of papers with Andre Wakefield and Johannes Mattes, another INHIGEO member. It is a pleasure to note that my research on the climb of Mt. Ararat was inspired by the INHIGEO meeting in Yerevan, in September 2018. I should also note that CSHPS meetings can be excellent opportunities to present work on the history and philosophy of the geosciences.

As "Past President" of the History of Earth Sciences Society I'd be remiss in my duties if I did not take this opportunity to invite INHIGEO members to consider subscribing to, or having their institutions subscribe to Earth Sciences History, a journal recognized as a leader in its field and a venue for the work of many INHIGEO members.

David A. E. Spalding

Publications

During 2019, I continued as a member of the editorial board of *Earth Sciences History*. This gave me the opportunity to review an interesting paper on early Canadian dinosaur discoveries, which has now been published in *Earth Sciences History* (Christison, Tanke and Mallon, 2020). One of the authors of this paper, INHIGEO member Darren H. Tanke, has also published during the year his biography of Alberta palaeontologist Hope Johnson, to which I contributed a foreword. (Tanke, 2019).

Through other INHIGEO contacts I was also privileged to read in MS a draft of a new book on the history of women in vertebrate paleontology. Authors Annalisa Berta (California) and Susan Turner (Australia) have produced an amazing compilation of information and stories about some 1200 women vertebrate paleontologists from the earliest to recent times. I was able to supply details of the women I had hired in this field, as well as others I have written about in my dinosaur histories, and other contacts around the world. *Rebels, Explorers and Scholars — Women in Vertebrate Paleontology* is heading for publication with Johns Hopkins University Press, provisionally in September 2020.

I am continuing with a longer-term project, writing memoirs covering particular periods of my life. Some of my experiences in the history of paleontology have been mentioned in books on dinosaur collection I have written or edited (Spalding, 1993, 1999 and Sternberg, 1985). The memoirs expand on these and include other material relating to the history of earth sciences, including my involvement in museums and lead mining history in the UK, early interests in such English geologists and paleontologists such as Mantell, Phillips, Sedgwick, Sheppard, Sorby, and my long friendship and collaboration with paleontologist, bibliographer and historian of geology William Sarjeant (1935-2002). So far, the memoirs include childhood and schooling (1937-1956, draft completed), my undergraduate years (1956-1959, draft completed) and my museum experiences in the UK (1959-1967, draft part written). At present I am focusing on my early years in Alberta (1967-1982) in which I was employed at the Provincial Museum of Alberta, became involved in the formation of what became the Royal Tyrrell Museum of Palaeontology, and began my investigations of the history of dinosaur discovery and had meetings with some of the earlier Canadian researchers.

During 2019 I also began gathering documents from my files related to the life of William Cutler (1878-1925), who collected dinosaurs in Alberta (Canada) and Tendaguru (Tanzania), for a future collaborative project.

Catching up on the Royal Alberta Museum

In last year's report I wrote briefly of the history of the Provincial Museum of Alberta (PMA), whose staff I joined in 1967 before its opening. It has now evolved into the Royal Alberta Museum and is housed in a splendid new building in downtown Edmonton. In September 2019, I took a visit to Edmonton and enjoyed a tour (Figs. 1-2) of this new facility, now the biggest museum in western Canada.

Figure 1. Royal Alberta Museum (RAM). L to R, hadrosaur Edmontosaurus (U Cretaceous), Alwyn Beaudoin (RAM present), David Spalding (PMA (now renamed RAM) 1967-1983). [Photo: Andrea Spalding].

My delightful host was Alwynne Beaudoin, Director of Natural History (Fig. 3), who is perhaps my third or fourth successor (and the first woman) in charge of natural history programs at the museum. We had interesting conversations about the earliest and most recent achievements of the museum while touring the galleries and the ever- fascinating facilities "behind the scenes."

Figure 2. Mastodon (RAM). [Photo: David Spalding].

Figure 3. Pleistocene vertebrates (RAM). [Photo: David Spalding].

While in Edmonton I also enjoyed a tour of the University of Alberta dinosaur labs, where my hosts were Philip J. Currie (Fig. 4) and Eva Koppelhus (Fig. 5). Phil had joined my staff at the Provincial Museum in 1976 as Curator of Palaeontology. We later worked together in the early 1980s planning the early stages of what became the Royal Tyrrell Museum of Palaeontology, when it grew out of the PMA palaeontology program to become an independent museum. When the Tyrrell opened in Drumheller in 1985, Phil became the museum's Curator of Dinosaurs, and also co-director of the Canada-China Dinosaur Project (one of the earliest East-West collaborations) in 1986. He later became a professor of dinosaur paleobiology at the University, where his wife Eva is also on the faculty. Eva is a paleobotanist from Denmark, specializing in the floras of the Cretaceous and working closely with Phil. With grad students and teams of volunteers, the two develop and manage collections of dinosaurs and plant fossils, conduct extensive research, and have collaborated on many publications.

Figure 4. Philip J. Currie with baby ceratopsian (Chasmosaurus). [Photo: David Spalding].

Figure 5. Eva Koppelhus with Paleobotany type collection. [Photo: David Spalding].

Publications

Berta, A. and Turner, S. (in press). *Rebels, Explorers and Scholars — Women in Vertebrate Paleontology*. Johns Hopkins University Press.

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Darren H. Tanke

After twelve years of research and writing, the biography of amateur Albertan paleontologist, naturalist and artist Hope Johnson (1916-2010) is finally done (Fig. 6; Tanke 2019a). She was largely self-taught in the earth sciences and used her artistic abilities to create several seminal illustrated identification guidebooks to the Late Cretaceous fossil vertebrates of Alberta. She was awarded an honorary doctorate from the University of Lethbridge in 1981. The 283-page soft cover and coil-bound book is available through the Alberta Palaeontological Society (APS) in Calgary, Alberta, Canada. Anyone wanting to purchase the book can visit the APS website at: **www. http://www.albertapaleo.org/.** At a book launch in Medicine Hat, AB on September 26th, I spoke about her to 38 members of the Medicine Hat and District Historical Society. I was later interviewed by a Medicine Hat newspaper (Gallant, 2019) and the new book discussed. Now the Hope Johnson book is done I can pursue other historical projects that have been on the proverbial "back burner".

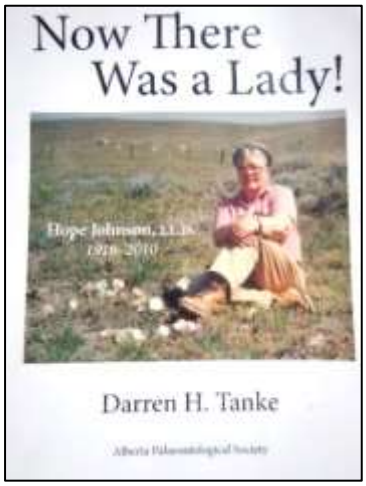

Figure 6. Hope Johnson book cover. [Photo: Darren H. Tanke].

At the 2019 Canadian Society of Vertebrate Paleontology conference, I was co-author on a poster presentation with Brigid E. Christison and Jordan C. Mallon (Christison *et al*., 2019) on the earliest collecting of Late

Cretaceous fossil vertebrates in western Canada by scientific expeditions (1874-1889). The full paper (Christison *et al*., 2020) came out on April 22, 2020 in *Earth Science History*.

In July, I went on a short trip to Montana, USA to sort through and save relevant letters, personal papers, maps, photographs, and other mementos of John L. Wegener on whom I am writing a biography. Wegener is widely credited as being the man who contacted the American Museum of Natural History (New York City) in 1909 about dinosaur bones on his land in Alberta, Canada which subsequently sparked "The Great Canadian Dinosaur Rush".

On September 15th I attended a small paleontology conference (Cretaceous and Beyond - Paleontology of the Western Interior) in Dickinson, ND. This excellent conference was hosted by the Badlands Dinosaur Museum (Dickinson, ND), North Dakota Geological Survey, and Dickinson and State University. I gave an oral presentation on the lost, but recently relocated, 1913-1914 American Museum of Natural History armored dinosaur quarry (Figs. 7a-b) and recovery efforts on bones found therein (Tanke 2019b). The first team accidently left some bones of the disarticulated skeleton behind. They were deeply buried and unseen by them, but subsequent erosion revealed them to us. Earlier evidence suggested it was from *Euoplocephalus* AMNH 5405, but new evidence refers it now to *Euoplocephalus* AMNH 5337. A fuller paper on this project nears completion.

a.

b.

Figure 7. (a). AMNH ankylosaur skeleton quarry in 1913 and (b) same site being reworked in 2018. [Photos: AMNH and Darren H. Tanke].

On November 30th I flew up to Grande Prairie, Alberta and gave a talk in the nearby town of Wembley at the Philip J. Currie Dinosaur Museum entitled "*Pachyrhinosaurus lakustai*: The ugly truth". This talk on the horned dinosaur *Pachyrhinosaurus* had a strong historical component covering the history of discoveries of this unusual genus across the Late Cretaceous of western North America (see Tanke 2006) and especially my museum's fieldwork at the *Pachyrhinosaurus* bonebed site (near Wembley), mostly in 1986-1989, preparation, mounting, and research on the material, in which I was heavily involved from start to finish. The *Pachyrhinosaurus lakustai* material formed the nucleus of the planning and eventual building of the museum there, though subsequent and ongoing fieldwork in the area by the Boreal Alberta Dinosaur Project (BADP) has revealed an interesting and diverse paleofauna.

I went to the Royal Ontario Museum in Toronto in January, 2020 and over four days went through their Albertan dinosaur collections, old paperwork and photographs for information that will be slotted into various ongoing Albertan vertebrate paleontology history projects I'm working on. A short memorial/biography on Tony Ashton, a Calgarian citizen who helped led to some important dinosaur discoveries in the 1990's nears completion and the manuscript will be submitted to the bulletin of the Alberta Palaeontological Society. This is another installment in my "Remember Me" series.

I transcribed the lost summer 1979 fieldnotes of Gilles Danis, a senior technician, then of the Provincial Museum of Alberta. These were found in the home of his ex-wife Jane Colwell-Danis, Canada's first academically-trained female vertebrate paleontologist of whom I've written about here previously.

I never recorded my own fieldnotes in 1979, my first summer in the field, but have managed to reconstruct most of them (only six days of two months missing), and other sources are possible so I may be able to fill in those blanks) using the field notes of co-workers and museum fossil catalogue records; the latter of which show where I was, when, and what was collected. Based on the success of this endeavor, I will likely attempt other years in which I also took no fieldnotes (1980-1981 and a few others) This will all be useful for the autobiography I am slowly picking away at.

During the pandemic I suggested a "make work" project which entails the complete digital transcription of all of the Philip J. Currie field notes held in our library collections. Some of the earlier notes had been typed up long ago, but none have been done on computer so searching for specific information was a very time-consuming process. Once digitized they will be easily searchable.

I am currently working with someone to develop Wikipedia pages on some amateur fossil collectors in Alberta, the late Irene Vanderloh and Dr. Hope Johnson. Both women made significant contributions to vertebrate paleontology in our province. The two pages should be up and running by mid-summer, 2020. Pages on some others may also be considered.

I have nominated Dr. Jordan C. Mallon, a vertebrate paleontologist at the Canadian Museum of Nature, Ottawa for membership into INHIGEO and am considering others.

I suspect the COVID-19 pandemic will seriously impact my earth sciences historical work in 2020-2021. I hope my INHIGEO colleagues worldwide keep well and stay safe during this serious global crisis.

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Clinton Tippett: I am a retired geologist, formerly with Shell Canada, living in Calgary, Alberta, Canada. I have continued to bring my geological background and historical knowledge to bear as the Chair of the Yukon Oil and Gas Advisory Committee and as a member of the Technical Advisory Committee – Energy for Geoscience British Columbia. Over the past year I have been involved in leading several field trips including an historical walking tour of downtown Calgary and an excursion to Turner Valley.

Petroleum History Society
My focus on historical geology over the past year continued to be primarily through the Calgary-based P.H.S. I am both its President and the Editor of its newsletter *Archives* (back issues of which are accessible through our website at www.petroleumhistory.ca). Production of this newsletter involves the creation of articles summarizing presentations that have been given, news items from the media, interpretive pieces, photographs (current and historical) and excerpts from the publications of related organizations. Quite a number of our most popular articles relate to geological controversies or situations having a strong geological foundation.

The P.H.S. sponsors 6-7 luncheons plus an Annual Meeting each year at which speakers address historical petroleum-related topics, many of which have a significant geological component. We have an annual awards program recognizing the preservation and communication of the history of the Canadian petroleum industry comprising Book of the Year, Article of the Year, Multimedia, Preservation and Lifetime Achievement. We have in the past organized topical field trips and walking tours, both of which have strong geological flavours. In 2019 the P.H.S. finished a transcription project for petroleum industry interviews that took place in the early 1980's. Many of these were with geologists. The audio tapes and all the transcription records were in the custody of the Glenbow Archives in Calgary however these have now been transferred to the Glenbow Western Research Centre at the University of Calgary.

Turner Valley Oilfield Society
During 2019, both the P.H.S. and I continued to cooperate with the T.V.O.S. which is building its organizational capacity with the assistance of the charitable Calgary Foundation. The T.V.O.S. is also working with the Government of Alberta to develop and enhance an interpretive program, including guided walking tours, at the Turner Valley Natural Gas Processing Plant. This now-inactive facility is both a provincial and a federal historic site, dating back to the late 1910's. The tours feature all aspects of petroleum exploration, production and processing including the interpretation of the geological context of this formerly prolific oil and gas field. The T.V.O.S. has a number of other preservation and communication initiatives ongoing as well as a speaker series and various documentation for tours of the Turner Valley region.

American Association of Petroleum Geologists
I am a member of the History of Petroleum Geology Special Interest Group of the A.A.P.G.

Canadian Society of Petroleum Geologists
In 2019, I was Past-President of the C.S.P.G. Within this organization I am the Chair of the History and Archives Committee. We are continuing to plan for the reinvigoration of our historical activities through the establishment of a committee in preparation for our centennial in 2027. This will involve interviews with key society participants and other activities, following in the footsteps of our 75th anniversary celebrations in 2002. In addition, I am the Chair of the C.S.P.G. Stanley Slipper Gold Medal Committee that selects the recipient for this award that honours an individual who has made outstanding contributions to petroleum exploration in Canada, be that through their own accomplishments, by leading exploration teams or through mentorship. An understanding of the evolution of geological concepts is a key factor in exploration success. I have been involved in numerous technical forums related to geological concepts and have been active as an editor for a forthcoming book comprised of geologically-oriented hikes in Alberta and British Columbia. I have personally sponsored a number of these hikes in honour of prominent Canadian geologists.

Petroleum History Institute
I am a life member of this organization. Its annual symposium was held in 2019 in St. John, New Brunswick, but unfortunately I was not able to attend.

Geological Society of America
I am a member of the History and Philosophy of Geology Division of the G.S.A.

Alberta Palaeontological Society
I am a member of this society. Activities include monthly presentations on matters related to palaeontology including key locales, controversies and recent developments. An annual forum occurs every year in March and a series of field trips are organized each summer.

(This report compiled and edited by Darren H. Tanke, Canada INHIGEO member)

CHINA

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Tel: (86)13811404351, 010-57552571.

Research Interest/Fields: The history of science in modern China (History of Geology, History of Geoscience).

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COSTA RICA

In Costa Rica (Central America) there are two members in INHIGEO: the geologist **Gerardo J. Soto** and **Guillermo E. Alvarado**. Guillermo Alvarado published several papers and comments related to the history of Volcanology in Costa Rica (see below), chemistry, and xxx, and made several lectures.

In the chapter IV of the book title "Perspectiva geológica del noroeste de Costa Rica: historia, evolución y cartografía" (edited by P. Denyer, 2019), Alvarado & Denyer provided the introduction of the history of the volcanological researches in the Guanacaste volcanic range, in the NW part of Costa Rica.

Also, in the paper Elizondo *et al.* (2019), they used old photographs of volcanic craters to make a chronological reconstruction and evolution of the active craters in Costa Rica since the end of XIX century to the beginning of XXI century.

In the paper Alvarado & García-Casco (2019), they made an archeological and geological summary and up today of the ideas and results of the source of the pre-Columbian jade in Costa Rica.

Finally, several talks (National Academy of Science in San José, Costa Rican-German Humboldt School in San José, DAAD Congress in San José) and reports in newspapers was done about two historical topics.

1. The UNESCO designation of the 2019 International Year of the Periodic Table, marking the 150th anniversary of the Mendeleev periodic table of elements, which is an iconic image and a fundamental tool to all who learn and work in science (*i.e.*, geochemistry, petrology, environmental geology, *etc.*), at all stages of their learning and career.

2. The 250th Anniversary of the birth of Alexander von Humboldt and his contributions to science.

Papers related to different topics of History of Geosciences

Alvarado, G. E. & Aguilar, T., 2019. La explotación de ostras perlíferas en Costa Rica (América Central) desde la Conquista hasta inicios del siglo XXI: Historia, conquiliología y algunas reflexiones. *Rev. Geol. Amér. Central*, 60: 93-107.
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Elizondo, V., Alvarado, G. E. y Soto, D., 2019. Evolución espacio-temporal de las bocas eruptivas de los volcanes Irazú, Arenal, Turrialba y Poás en tiempo histórico (Costa Rica). *Rev. Geol. Amér. Central*, 61: 35-55.

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Alvarado, G. & Espinosa, M., 2019. El 2019 declarado el Año Internacional de la Tabla Periódica de los Elementos por la UNESCO. *GOAL-DAAD Newsletter* 1, June: 19-21.

Alvarado, G. E., 2019. Alexander von Humboldt, el "Shakespeare" de los científicos. En: La Nación, 21-VII-2019, Áncora, p. 3, San José, https://www.nacion.com/ancora/250-anos-del-nacimiento-de-un-sabio-alexander-von/OW2PA43QR5A3XB4QIDQ6ZZFP3U/story/'outputType=amp-type.

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Guillermo E. Alvarado, San José, Costa Rica

CZECH REPUBLIC

Alena Čejchanová: my last activity was the brochure - Alena Čejchanová, Arnošt Dudek, Ferry Fediuk, Alfred Lenz, Eva Trojanová, Gordon Winder, Grant M. Young, Jana Zoubková:

Zmařený kongres. Osobní vzpomínky několika účastníků 23. mezinárodního geologického kongresu. ČGS Praha (*Wasted Congress. Personal memories of several participants of the 23rd International Geological Congress. CGS Prague, 2019).*

The International Geological Congress[20] in 1968 was supposed to last almost a month – from the 19th until the 28th of August 1968 in the capital city of the Prague, with excursions from 8 August to 7 September - but ended prematurely. The break was caused by the occupation of Czechoslovakia by the allied troops of the five states of the Warsaw Pact. Only excursions before the Congress took place, the actual session lasted only five days. The military occupation and the extraordinary situation in Czechoslovakia caused the early departure of delegates and the end of the congress. In addition to a rich cultural and scientific program, the congress also aimed to organize the newly established IUGS organization with the existing IGC and cooperate on a number of international projects.

Tanks below the railway bridge near the Congress building in Prague, 1968 - Holešovice

[20] See a more detailed description of this historical meeting in *INHIGEO Annual Record No. 51* (2019), p. 71-73.

The publication was created from archival documents and photos, and, first of all, from personal memories of several living participants in the Congress in 1968, mostly Czech, but also including several from other countries. It also contains the interview with Dr. Arnošt Dudek (nearly 92 years old), the then Secretary General of the Organizing Committee of the 23rd International Geological Congress in August 1968 in Prague. The book was published just before my retirement from CGS and is in Czech only.

Jan Kosak: Retired January 1, 2019, after 54 years with the Geophysical Institute.

Publications:

Barta, M., and Kovář, M., editors, and by Kozák, J., *et al.*, (2019). *Civilizations: Collapse and Regeneration*, 820 pp., ACADEMIA, Praha, ISBN 978-080-200-2907-2.

Kozák, J. and Musson, R. M. W., (2020). *The Illustrated History of the Elements*, 273 pp., SPRINGER, ISBN 978-3-030-21424-1; ISBN: 978-3-030-21426-5 (e-book).

FRANCE

The French Committee on the History of Geology (Cofrhigéo) publishes an annual periodical, *Travaux du Comité français d'Histoire de la Géologie* (ISSN 1156-2919), which is available online at the following addresses:
https://hal.archives-ouvertes.fr/COFRHIGEO/browse/period
http://www.annales.org/archives/cofrhigeo/travaux.html.

The 31st volume of this periodical was issued in 2019 and contains the following articles:

TAQUET, Philippe. Lettre à l'attention des géologues sur l'intérêt de conserver leurs archives de manière durable et sur les moyens dont ils disposent pour le faire, p. 5 [Letter to the attention of geologists on the interest of preserving their archives in a sustainable way and on the means they have to do so].

GOHAU, Gabriel. Théories tectoniques globales d'hier et d'aujourd'hui, p. 7-15 [Global tectonic theories of yesterday and today].

LE PICHON, Xavier. La Tectonique des Plaques cinquante ans après : souvenirs et réflexions d'un des acteurs de sa mise en place (conférence disponible sous forme de vidéo), p. 17 [Plate Tectonics fifty years later: memories and reflections of one of the actors in its establishment (conference available in video form)].

TAQUET, Philippe. Analyse d'ouvrage : Mott T. Greene (2015). Alfred Wegener. Science, Exploration and the Theory of Continental Drift. John Hopkins University Press, Baltimore. 674 p., p. 19-21.

BOBECK, Patricia et RICHET, Pascal. L'abbé Jean-Baptiste Paramelle (1790-1875) : un pionnier de l'hydrogéologie karstique au début du XIXe siècle, p. 23-43 [Father Jean-Baptiste Paramelle (1790-1875): a pioneer of karst hydrogeology in the early 19th century].

DREYER, Françoise. Voir et dire le Danien : un exemple de changement de cadre de pensée en géologie, p. 45-61 [Seeing and saying the Danian: an example of a change of thinking in geology].

BERGERAT, Françoise. Présentation de l'ouvrage 14-18, La Terre et le Feu. Géologie et géologues sur le front occidental (2018). Co-édition AGBP-COFRHIGEO-SGN, Mém. h.-s. n°10 de l'AGBP, 480 p., 355 ill., p. 63-76 [Presentation of the book "14-18, Earth and Fire. Geology and geologists on the Western Front" (2018)].

LE VIGOUROUX, Philippe. L'introduction de la théorie des translations continentales de Wegener dans l'enseignement des sciences naturelles en France (1920-1960), p. 77-102 [The introduction of Wegener's theory of continental translations in the teaching of natural sciences in France (1920-1960)].

SAVATON, Pierre. Une révolution dans l'enseignement des sciences de la Terre en collèges et lycées : l'introduction de la tectonique des plaques 1980-1988, p. 103-126 [A revolution in the teaching of Earth sciences in middle and high schools: the introduction of plate tectonics 1980-1988].

GODARD, Gaston. Bibliographie des travaux sur l'histoire de la géologie en France jusqu'en 2018, p. 127-142 [Bibliography of works on the history of geology in France until 2018].

An important collective book on the history of the geology of the French Massif Central was published in 2019:
"*Histoire de la découverte géologique du Massif Central français*", Mémoire de la Société d'Histoire naturelle d'Auvergne, n° 8, 2019, 267 p. [https://shnaauvergne.wixsite.com/shna].

Finally, several other studies on the history of the geosciences were published in 2019 by members of the Cofrhigéo (non-exhaustive list):

BULAKH, A. & TOURET, J., 2020. Shoksha quartzite, a heritage stone of international importance from Russia, 8 p. *in* Hannibal, J.T., Kramar, S. & Cooper, B.J. (eds). *Global Heritage Stone: Worldwide examples of heritage stones*. Geological Society, London, Special Publications, 486.

DREYER, F., 2019. L'hypothèse de la Terre « boule de neige » [The Earth's "snowball" hypothesis]. La Science au présent, Encyclopædia Universalis, Paris, p. 96-109.

GODARD, G., 2019. "La découverte de la glaucophane à Groix en 1883: Histoire d'une mystification" [The discovery of glaucophane in Groix Island in 1883: history of a mystification]. *Bulletin de la Société géologique et minéralogique de Bretagne*, Série D, n°17, p. 31-56.

GODARD, G., 2019. "Un manuscrit sur les faluns miocènes de Salles en Gascogne, écrit vers 1660 : Reflections sommaires sur quelques pierres de la Terre de Sales. A manuscript on the Miocene shelly sediments of Salles in Gascony, written around 1660". *Bulletin de la Société Linnéenne de Bordeaux*, 154 (n.s., n° 47)(3-4), p. 249-260.

MERGOIL, J., MERGOIL-DANIEL, J., 2019. L'émergence de la connaissance des volcans en Auvergne au XVIII^{e} siècle: les pionniers. *Mémoire de la Société d'Histoire naturelle d'Auvergne*, n° 8, 17-31.

Claudine Cohen, Professor at EHESS (Ecole des Hautes Etudes en Sciences Sociales, Paris) Centre de Recherches sur les Arts et le Langage, Chair « History of palaeontology - representations of Prehistory;
-Cumulative Professor at EPHE (Ecole Pratique des Hautes Etudes, Earth and Life Sciences section), Laboratory Biogeosciences, Dijon. Chair "Biology and Society"

RESEARCH

Seminars

During the Spring Semester and the Fall semester 2019, I organized and held my EHESS seminar on "Sciences, images and imaginations of the Earth." In the framework of this seminar, Pr. Luca Ciancio (University of Verona), whom I invited to EHESS for a month in Paris, presented a series of lectures on the search for a " place for hell" in 17th century natural sciences.

I organized and introduced the scientific annual colloquium of my other academic institution, l'Ecole Pratique des Hautes Etudes (Third section, Life and Earth Sciences) on "Form and movement" on November 27th, 2019. In this framework I presented a paper on "Form and movement in Richard Owen's *On the anatomy of limbs* (1848)"

I started a new research program on the history of the scientific uses of uses of the notion of "race" in France, in collaboration with anthropologists and palaeoanthropologists of Broca Laboratory EPHE, Bordeaux (Olivier Dutour, Hélène Coqueniaux) and Population geneticist Michel Veuille (Paris). We work in particular on unpublished material from Paul Broca's archives held in Bordeaux.

Field exploration :

I went to visit and study the Foz Coâ Valley prehistoric engravings (Portugal) 2-4 November 2019.

CONFERENCES :

Conferences organization

I co-organized and participated to the International symposium "Defining Humanity" (in collaboration with Etienne Bimbenet, Bruno Maureille, Bordeaux University) Les Eyzies and Bordeaux 3-5 October 2019.

Papers given at conferences

C. COHEN, "Evidence in Paleontology and Prehistory", workshop on *L'Histoire : l'enquête* Ecole Normale supérieure, Paris, April 4th-6th.

COHEN C., "From Deluge to *Diluvium*: the role of the biblical Flood in 17th/18th Earth Theories" *Intersections of Earth Science and Theology in the long 18th Century*, Göttingen, 11-13 July 2019.

COHEN C. "Early-Modern theories on Human origins: French free-thinking, human origins and the history of the Earth" (17th -18th century) *INHIGEO Congress*, Varese, 2-12 September 2019.

COHEN C. "Gender in Prehistory - women's roles through palaeolithic art" *The Dissident Goddesses' network* – MAMUZ Museum - Mittelbach Autriche 14-16 September 2019.

COHEN, C. "Debates on Girls' education in 18th century France," Science Matters: questions of education, Cascais, Portugal, October 27th-31st.

LECTURES

"Fakes and the Ethics of Science" Seminar on the history of biology, Ecole Normale Supérieure, Paris, April 12th, 2019

PUBLICATIONS

Books

Boucher de Perthes, les origines romantiques de la préhistoire, with Jean-Jacques Hublin, revised edition, Paris, Belin coll. Alpha, 2019

[Nos ancêtres dans les arbres. Réflexions sur l'évolution humaine - The book is complete but its publication at Editions du Seuil has been delayed to 2021].

Paper

COHEN C, "De l'Age de Pierre au *Sacre du Printemps*: Primitivité et préhistoire dans l'oeuvre de Nikolas Roerich (1895-1917)" *Slavica occitania*, 48 (2019), pp. 63-101.

Prefaces

Preface to Claire Artemyz, *A une passante*, a Photo album on Prehistoric Venuses, Paris, 2019.
Préface to Mathilde Lequin *Bipédie et origines de l'humanité Paris,* ed. Hermann 2019.

Referees

I served as a referee for several institutions (CNL, the French National Book Center) and journals (*Palevol*, *Earth Science History*).

Films

Series: *Femmes de terrain (Women in the Field).*
- "Assumpcio Vila, ethnoarchéologist" (30 mn) Réalisation Momoko Seto.
- "Dorothy Garrod and Prehistoric archaeology" (20 mn) Réalisation Momoko Seto.

Juries and other academic responsibilities

During the year 2019 I was a Member of the CNU (French National University Council) section 72 (History and Philosophy of science).
Membre du Comité de pilotage et du jury de la chaire "Beauté" PSL L'Oreal
Membre du Jury du prix Fondation Engie Paris Museum of Natural History
Membre du Comité consultatif de l'Institut Diderot, Paris (dir. D.Lecourt et J.-C. Seys)

DISSEMINATION OF KNOWLEDGE

I was invited to give several public lectures on various subjects in relationship with my recent publications. I participated in the Book Fair of La Chapelle aux Saints (April 27th – 28th 2019).
I was interviewed in the framework of several television programmes (France 5, A2) and radio programmes (Radio J, France Culture).
I was invited to participate to the Summer Astronomy Festival in Fleurance (Gers, France) (3-9 août 2019). In this framework I gave several talks and a public lecture on *La vérité en biologie: l'évolution et ses preuves* ("Truth in biology: what evidence for evolution?") August 3, 2019.

Submitted by: G. Godard, Secretary of the Cofrhigéo.

GERMANY

In 2019, Germany lost its sole remaining INHIGEO Honorary Senior Member. On July 26th, **Martin Guntau** died aged 85, following a long period of poor health (see the Obituary Section in this issue).

Martin had participated in the first ever INHIGEO Symposium in Yerevan, 1967. By then, he was already on his way to becoming the most eminent historian of geology which the two Germanys had produced in the last half-century. From the 1970s onwards, a sizeable part of Martin's research became available in English, adding to his growing reputation even beyond German-speaking territories. Throughout his active career, Martin was keenly involved in the running of INHIGEO (with stints both as Secretary-General, 1976-1984, and as President, 1989-1992, of our society). Being a universally liked towering figure in his chosen speciality, at least from the perspective of his German colleagues, Martin's passing feels like the end of an entire era.

A number of obituaries giving more detail on the historical work done by Martin are currently in the making (including an extensive account to be published in *Earth Sciences History* no. 2/20); we plan to offer a guided summary to those for the *INHIGEO Annual Record No. 53* for 2020.

Germany has not gained any new INHIGEO members since 2018, the current number now amounting to 10. There are no further changes to the information given last year (cpr. *INHIGEO Annual Record* no. 51, pp. 106-109) and no fundamental differences to the national set-up described there.

Publications

A new issue of the annually published *Geohistorische Blätter*, currently the only national journal devoted to the history of the earth sciences, came out in September. This volume (no. 30) includes a most welcome extensive article by Heinz-Gerd Röhling, Ernst-Rüdiger Look and Max Schwab on the work done by Ernst August Lossen (1841-1893) in the Harz Mountains. Lossen was one of the outstanding geologists of his generation, but, probably owing to his early death from kidney failure, didn't acquire the historical status his achievements warranted. Another lengthy contribution, by Frank Löcse and Ronny Röβler, is devoted to the Swiss Geologist Leo Wehrli and his research on the Permian Petrified Forest ('Versteinerter Wald') of Chemnitz in Saxony (an impressive amount of whose fossil trunks are on regular display in the local Museum für Naturkunde). Johannes Baier gives an account of the mineralogical activities of Johann Wolfgang von Goethe in Bohemia. Furthermore, this volume includes a number of smaller contributions as well as a few short biographical accounts more fitting for an undergraduate paper than an historical research journal.

The celebrations marking the 250th anniversary of the birth of polymath Alexander von Humboldt led to a number of publications. Of particular interest to historians of the earth sciences was *Alexander von Humboldt: Minerale und Gesteine im Museum für Naturkunde Berlin* (Göttingen, Wallstein, 2019), a 400+ pp. tome edited by Ferdinand Damaschun & Ralf Thomas Schmitt, and devoted to Alexander von Humboldt as a collector. A review by INHIGEO member Klaus Thalheim can be found in the *Geowissenschaftliche Mitteilungen* 78 (2019), pp. 129-130. The publication by Damaschun & Schmitt was complemented by an extensive museum exhibition (see `Museums` below).

Moving to major international journals in our field, vol. 38 (2019) of *Earth Sciences History* included three articles by German scholars: one each was written by INHIGEO members Martina Kölbl-Ebert and Klaus Thalheim (see below), another by the now retired ex-curator of the Museum für Naturkunde in Berlin, Barbara Mohr, titled 'The History of Geology Walls in Central Europe and Their Use as Pedagogical Tools for Explaining Geosciences' (pp. 371-383).

As to German INHIGEO members, the following papers were published in 2019:

Norman Henniges

Im Auge des Beobachters: Landschaft, Fotografie und der geographische Blick – die Wiener Geographen in Bosnien und der Herzegowina um 1900. Universität Wien, 7 Oktober 2019

Der Ariadnefaden im Labyrinth? Möglichkeiten und Perspektiven einer wissensgeschichtlichen Praxeologie, Deutscher Kongress für Geographie 2019, Kiel, 25 – 30 September 2019

Glacier Men: Albrecht Penck, Eduard Brückner and the experience of Quaternary fieldwork in the Alps and the Alpine Foreland, c. 1900. 44th Symposium of the International Commission on the History of Geological Sciences (INHIGEO) – Como & Varese (Italy), 2-12 September 2019

Die Welt auf Leinwand. Eine kurze Geschichte der Schulwandkarte, ca. 1840 bis 1970. Fränkische Geographische Gesellschaft, Erlangen, 01.07.2019

Martina Kölbl-Ebert

From Colleague to Enemy?: German Petroleum Geologists and the Cold War *in*: Silvia Fernanda Figueirôa, Gregory A. Good & Drilli Peyerl (Eds.) *History, Exploration & Exploitation of Oil and Gas* (Zürich: Springer, 2019), pp. 71–86.

Closing the Iron Curtain: How Geologists in Berlin Experienced the Cold War Era *in*: *Earth Sciences History* 38 (2019), pp. 94–123.
Geosciences in a Religious Setting? Thoughts on History of the Geosciences, Interdisciplinary Dialogue and Geoethics *in*: *INHIGEO Annual Record* 51 (2019), pp. 67–70.

Cornelia Lüdecke
Militärische und zivile Geographie: Von Carl Ritters Geographie in Berlin bis zu Karl Haushofers Geopolitik in München = Die Bibliothek der Erde 1 (Norderstedt: BoD - Books on Demand, 2019), 233 pp.
Vom Lokalen zum Globalen: Alexander von Humboldt und sein Einfluss auf die Entwicklung der Geowissenschaften *in*: *Naturwissenschaftliche Rundschau* 72 (2019) = no. 854 (8/19), pp. 400-417.

Klaus Thalheim
Ein fast vergessener Mineraliensammler *in*: Robby Joachim Götze (Ed.) *Die Sammlung Paul Geipel* (Dresden: Sandstein, 2019), pp. 168-189.
Mineralogische Sammlungen: Archive für die Forschung *in*: Wolfgang Hesse & Holger Starke (Eds.) *Die Masse macht's?: Erschließungsmethoden und Erkenntnismöglichkeiten bei der Arbeit mit Massenbeständen* (Dresden: Stadtmuseum Dresden, 2019), pp. 30-40 & 83 (= published papers from the conference refered to in the last *INHIGEO Annual* Record on p. 108), accessible online via https://tud.qucosa.de/landing page/?tx_dlf[id]=https%3A%2F%2Ftud.qucosa.de%2Fapi%2Fqucosa%253A35306%2Fmets
The 1477 Silver Find at the St. Georg Mine in Schneeberg and Significant Ore Specimens in the Museum of Mineralogy und Geology in Dresden *in*: *Earth Sciences History* 38 (2019), pp. 157-172.

Conferences
By far the biggest event was, of course, the 2019 INHIGEO Symposium in Varese and Como (2.-12.9.2019). German members **Norman Henniges, Martina Kölbl-Ebert** and **Peter Schimkat** attended, and all of them contributed with a talk (see below). In addition, Martin Ebert and Barbara Mohr, the latter speaking about *Teaching Geosciences from the 19th Century on in Central Europe and Its Influences on Society*, also participated.

Martina Kölbl-Ebert attended two further conferences, giving a paper at both of them (see below). The year 2019 saw seven individual talks by INHIGEO member **Cornelia Lüdecke** (see below), and, twice, the organization of entire sessions. The first, on 'History of Meteorology', was at the conference (18.-22.3.2019) DACH2019 (a joint venture of the major German, Austrian and Swiss societies of Meteorology, combining research on and dissemination of meteorological topics). The second was centred around 'Antarctic History' and took place at a conference (3.-5.4.2019) on 'Antarctic Connections at the End of the World: Understanding the Past and Shaping the Future' of the Standing Committee of Humanities and Social Sciences of SCAR (= Scientific Committee on Antarctic Research)

Overall, the following talks by German INHIGEO members were given at conferences:

Norman Henniges
Im Auge des Beobachters: Landschaft, Fotografie und der geographische Blick – die Wiener Geographen in Bosnien und der Herzegowina um 1900. Universität Wien, 7 Oktober 2019
Glacier Men: Albrecht Penck, Eduard Brückner and the Experience of Quaternary Fieldwork in the Alps and the Alpine Foreland, c. 1900 at: **Somma Lombardo**, *44th INHIGEO Symposium* (7.9.2019).
Der Ariadnefaden im Labyrinth? Möglichkeiten und Perspektiven einer wissensgeschichtlichen Praxeologie, Deutscher Kongress für Geographie 2019, Kiel, 25 – 30 September 2019
Die Welt auf Leinwand. Eine kurze Geschichte der Schulwandkarte, ca. 1840 bis 1970. Fränkische Geographische Gesellschaft, Erlangen, 01.07.2019

Martina Kölbl-Ebert
Mapping the Underground of Northern Germany: German Petroleum Geologists between Science and Preparation for War at: **Eichstätt**, Katholische Universität Eichstätt-Ingolstadt, *16th Conference on 'Neue Kulturgeographie'* (2.2.2019).
Ladies with Hammers: Exploring a Social Paradox in the Early 19th Century of Britain at: **London**, Geological Society of London, History of Geology Group, *A Centenary Celebration of the First Female Fellows of the Geological Society of London* (21.5.2019).
Limits of Communication: Letters by German Geologists in the Context of the Nazi Regime at: **Varese**, *44th INHIGEO Symposium* (4.9.2019).

Cornelia Lüdecke

Die Geographische Gesellschaft München: Gründung und erste Jahrzehnte at: **München,** Bayerische Akademie der Wissenschaften, *Festveranstaltung "150 Jahre Geographische Gesellschaft München"* (14.3.2019)

(with Michael Börngen) Luise Lammert und ihre Forschungsreise nach Australien 1928/29 at: **Garmisch-Partenkirchen**, *DACH 2019* (22.3.2019).

To Recognize or Not to Recognize Polar Heritage in Svalbard: A Touristic Perspective Presented by a Polar Historian at: **Buenos Aires**, Instituto Nacional de Antropologia y Pensamiento Latinoamericano, *Simposio Patrimonio en lugares remotos* (29.3.2019).

How to Reach the Poles? Roald Amundsen's Strategies of Navigation at: **Ushuaia / Argentina**, SCAR, *Conference of the Standing Committee of Humanities and Social Sciences* (4.4.2019).

Alexander von Humboldts Forschungsreisen at: **München**, Zentrum russischer Kultur in München, *Veranstaltung "Auf den Spuren Alexander von Humboldts in Russland"* (26.4.2019).

Vom Lokalen zum Globalen: Alexander von Humboldt und die Entstehung der Geowissenschaften at: **Moskau**, Staatliche Lomonosow-Universität, *Internationales Symposium "Das Erbe Alexander von Humboldts heute: Zum 250. Geburtstag Alexander von Humboldts und dem 190. Jubiläum seiner Reise nach Russland"* (20.9.2019) = KeyNote Speech.

Vom Lokalen zum Globalen: Zur Bedeutung von Alexander von Humboldts Forschungsreisen für die Entstehung der Geowissenschaften at: **Berlin**, Russisches Haus der Wissenschaft und Kultur, *Festveranstaltung "Alexander von Humboldt und Russland"* (1.11.2019).

Peter Schimkat

Commemorating *Vulkanismusstreit und Geochemie* (1991): A Forgotten Modern Classic Revisited at: **Como**, *44th INHIGEO Symposium* (6.9.2019)

Universities

INHIGEO members **Martina Kölbl-Ebert** and **Cornelia Lüdecke** continued to teach at the University of Hamburg. In 2019, the following one-week courses were offered by them:

Martina Kölbl-Ebert

Erddynamik und Prozesse: Geschichte der Geologie und Geophysik (25.-29.3.2019)
Minerale und Gesteine: Geschichte der Mineralogie, Petrologie und Geochemie (7.-11.10.2019)

Cornelia Lüdecke

Einführung in wissenschaftliche Arbeitsmethoden an Beispielen aus den Geowissenschaften (13.-17.5.2019)

Museums

The 250th anniversary of Alexander von Humboldt's birth not only led to a number of talks, but also to several exhibitions displaying his scientific achievements. Not all of them put a strong emphasis on the earth sciences, but they nevertheless gave interesting insights into the life of a naturalist during Humboldt's era and usually were well-received by the public. A good (and very accessible) example was the extensive poster exhibition *Forscher, Sammler, Pflanzenjäger – unterwegs mit Humboldt & Co*, organized by the Verband Botanischer Gärten and on display at more than 30 Botanical Gardens in Germany and Austria.

In the Museum für Naturkunde in Berlin, the Humboldt Year was celebrated with an exhibtion focused on the earth sciences. Here, the mineralogical specimen initially acquired by Humboldt (nowadays part of by the museum) were on show, thereby emphasizing the role of Humboldt as an instigator of later museum collections. This exhibition now continues to run until September 2020. An English introduction to the items on display can be found on the following weblink: www.museumfuernaturkunde.berlin/en/humboldt-intervention.

The second big anniversary event of the year with ties to the history of the (so to speak) earth sciences led to museum exhibitions as well. However, the celebrations surrounding the landing of the Eagle in the Sea of Tranquility on 20.7.1969 came with even less an emphasis on topics central to the earth sciences. None of the newly created planetarium shows over here addressed them in much detail either.

Public Lectures
Martina Kölbl-Ebert
Vom Vulkan zum Impaktkrater: 100 Jahre Impakthypothese am Nördlinger Ries und Steinheimer Becken at: **Nürnberg**, Naturhistorische Gesellschaft (28.2.2019).
'Deutsche Geologie': Geologie in Deutschland 1935 bis 1945 at: **München**, Freundeskreis der Geologischen Staatssammlung (5.4.2019).

Cornelia Lüdecke
Deutsche in der Antarktis at: **München**, Geographische Gesellschaft München, (31.1.2019)
Der größte Umweg der Welt: Wie Roald Amundsen auf seinen Expeditionen den Süd-und Nordpol eroberte at: **München**, MS Utting (19.2.2019).
Geschichte der deutschen Antarktisforschung vom Kaiserreich bis heute at: **Bremen**, Überseemuseum (16.4.2019).
Aus der Geschichte der Polarforschung: Deutsche Antarktisexpeditionen at: **Murnau**, Murnau Club (25.10.2019).
Erich von Drygalski (1865-1949): Ein Münchner(?) Polarforscher at: **München**, Künstlergesellschaft Allotria (4.11.2019).

Additional Information from Individual German Members
Die Spur des Eises: Eine praxeologische Studie über die wissenschaftlichen Anfänge des Geologen und Geographen Albrecht Penck (1858-1945), the 556pp monography by **Norman Henniges** on the life and work of Albrecht Penck until c. 1914 (initially published 2017 by the Leibniz-Institut für Länderkunde in Leipzig, as vol. 69 of its *Beiträge zur Regionalen Geographie*) is now available online. It can be accessed, via the SSOAR (Social Science Open Access Repository) site, under the following weblink: www.ssoar.info/ssoar/handle/document/63355

We congratulate **Cornelia Lüdecke** who received the 'Paulus Preis' of the Deutsche Meteorologische Gesellschaft (see Awards section of this issue).

By scrolling down (or turning a few dozen pages) towards the section 'INHIGEO Virtual Bibliography', you should be able to find a short summary on the historiography of the history of geology in Germany from early 19th century to 1967 (the time of the first INHIGEO Symposium) written by **Peter Schimkat**.

Peter Schimkat (on behalf of the German members of INHIGEO).

HUNGARY

Lectures presented in the sessions of History of Science Section of Hungarian Geological Society, 2019:

January 21.
Csath, B.: Statues of Vilmos Zsigmondy.
Zelenka, T.: Swelling volcanic glasses in Hungary.

February 18.
Kecskeméti, T.: The memory of András Kaszap.
Vitális, Gy.: András Kaszap and the journal Földtani Közlöny (Bulletin of the Hungarian Geological Society).
Csongrádi, J.: Mineral prospecting in Gobi Altai Mts.

March 25.
Szűcs, I.: Memorial plaques of Vilmos Zsigmondy.
Brezsnyánszky, K.: Episodes of the history of the Hungarian Geological Institute founded 150 years ago.

April 15.
Dobos, I.: Gyula Halaváts, the forgotten investigator of hydrogeology of the Hungarian Great Plain.
Kecskeméti, T.: 150 years of the journal Természet Világa/Természettudományi Közlöny (World of Nature/Bulletin of Natural Sciences)

May 20.
Viczián, I. and Pathy-Nagy, G: Sámuel Nagy, Hungarian secretary of the Jena Mineralogical Society – according to the documents preserved in his family.
Tóth, Á.: The bauxite at Gánt and its discoverer Jenő Balás – ideas and information.

June 17.
Babinszki, E.: The story of that art nouveau building – presentation of a new book prepared to the 150 years anniversary of Hungarian Geological Institute.
Zsadányi, É: Data to the history of the Mining and Forestry High School of Sopron between 1921-1934.

September 16.
Bihari, D.: Strolling in southern Mongolia.
Körmendi, A.: Application of remote sensing and geophysical methods in the solution of a historical enigma. Location of the tomb of sultan Suleiman at Szigetvár, Hungary.

October 7.
Scientific session celebrating the 90th birthday of György Vitális**. (**Jointly held with the Hydrological, Mining and Metallurgical and Speleological Societies.**)**

November 11.
Tardy, J.: Outlines of the history of geological environmental protection in Hungary.
Balázs, R. (Kiskunság National Park): History of protection of outcrops of lacustrine limestone.
Baráz, Cs. (Bükk National Park): History of protection of "bee hive rocks".
Prakfalvi, P.: Beginning of geological environmental protection in the territory of Novohrad-Nógrád Geopark (with contributions by Á. Tóth)

November 18.
Kálmán Szepesházy memorial session
Pósa Homoly, E.: Preservation of the memory of Kálmán Szepesházy in his native country.
Gaál, L.: Ties of Kálmán Szepesházy to his native country.
Kun, F.: Kálmán Szepesházy, patron of art.
Szepesházy, K.: My memories on the captivity in Russia (the audio record was presented by Béla Nagy).

December 20.
Kubassek, J.: In the steps of Antal Reguly in the Polar Ural.

Regional meeting, Balatonfüred, October 3–5, 2019.
The Hungarian Geological Society and the Association of Hungarian Geophysicists commemorated two important anniversaries in the year 2019, by a festive regional meeting held in Balatonfüred October 3–5, 2019. The Royal Hungarian Geological Institute was founded 150 years ago, in 1869. The other anniversary was the centenary of the death of Loránd Eötvös in 1919.

In the plenary session Brezsnyánszky, K. reviewed the 150 years history of the Hungarian Geological Institute. Magyar, B. considered Loránd Eötvös as "father of applied geophysics".

In honour of the 150th anniversary of the establishment of the Royal Hungarian Geological Institute a memorial book was published (in Hungarian):

Babinszki, Edit, with contributions by Mária Földvári, Zsolt Kercsmár, Edit Király, Gyula Maros, László Orosz, Bálint Péterdi and Edit Thamó-Bozsó: *150 éves a Földtani Intézet. 150 years of the Geological Institute.* Magyar Bányászati és Földtani Szolgálat (MBFSZ), Mining and Geological Survey of Hungary, Budapest, 2019. 251 p.

On the occasion of the centenary of Eötvös a memorial album was published in Hungarian and English languages: Eötvös Loránd Emlékalbum, 176 p., Kossuth Kiadó, Budapest, 2019.

Conference on History of Science and Technology, Temesvár (Timişoara, Romania), June 27-30, 2019, organised by the Hungarian Technical Scientific Society of Transylvania – EMT.
The meeting included an interesting excursion to the mining area of Banat. Classical ore and coal mine localities and railway lines from the early period of industry were visited during the excursion.

The following presentations (in Hungarian language) were related to the history of earth sciences:
Szarka, L., Sólyom, J., Zelei, G.: The living heritage of Loránd Eötvös.
Wanek, F.: Data to the history of quarrying around Kolozsvár (Cluj-Napoca).
Pápay, L.: Commemorative Plaques at University of Szeged, Department of Mineralogy, Geochemistry and Petrology.
Both, M.: Landscape and science in the age of enlightenment.
Cserny, T., Sárdy, J.: The geographer and geologist Lajos Lóczy, approaching the centenary of his death.
Viczián, I.: Hand-written mineralogical tables of József Szász (1782-1812) in the Teleki Téka Library, Marosvásárhely (Târgu Mureş).

XXIst Meeting of Geologists of Székely Land, Szováta, (Sovata, Romania), October 24-27, 2019.

During the excursion of the meeting in the village Nyárádremete (Eremitu) the commemorative plaque of Ferenc Nyulas was visited. He was the first to point out to the existence of natural gas in the Transylvanian Basin (1808).

The following presentations (in Hungarian language) were related to the history of earth sciences:
Miklós, A.: Foreign travellers in the salt mine works of Transylvania and Máramaros (Maramureş) in the 18-19th century.
Wanek, F.: The role of Saxon (Transylvanian German) geologists in discovering the geology of Székely Land.
Papucs, A.: Etymology of the word *borvíz* (mineral water).
Viczián, I.: Papers related to mineralogy by József Szász in the Teleki Téka Library, Marosvásárhely (Târgu Mureş).

Additions to the Annual Record for 2019, Hungary

New publications

Brezsnyánszky, Károly 2019: Emlékezzünk a 150 éve alapított Földtani Intézetre! – Földtani és Geofizikai Vándorgyűlés, A Magyar Királyi Földtani Intézet és az Eötvös Loránd Emlékév tiszteletére (Geological and Geophysical regional meeting, in honour of the Hungarian Royal Geological Institute and Loránd Eötvös memorial year), Előadás-kivonatok, kirándulásvezető (Abstracts and Excursion Guide), Balatonfüred 2019. pp. 7-10.

Brezsnyánszky, Károly 2019: 150 éve alakult meg a Magyar Királyi Földtani Intézet (150 years of foundation of Royal Geological Institute). – Honismeret, A Honismereti Szövetség folyóirata (Local History. Journal of Local History Association), 47, 6, pp. 3-8.

Dobos, Irma 2019: A tanár és a tanítvány (The teacher and the student. Memory of the hydrogeologist Miklós Aldobolyi Nagy). – A Hódmezővásárhelyi Szeremlei Társaság Évkönyve (Annals of the Szeremlei Society in Hódmezővásárhely) 2019, 303-312.

Dobos, Irma 2019: "… levelet hozott a posta …" (A story, how the Hungarian Post has found her in the Geological Institute). – Vásárhelyi Látóhatár (Horizon of Vásárhely) 2019, 9, 22-26.

Dobos, Irma 2019: Az első tudományos egyesület, a Magyarhoni Földtani Társulat (The first scientific society in Hungary, the Hungarian Geological Society). – Vásárhelyi Látóhatár (Horizon of Vásárhely) 2019, 9, 18-21.

Dobos, Irma 2019: Régi emlékek (Memory of the Szentes thermal well). – Szentesi Mozaik (Mosaic of Szentes) 2019, July.

Papp, Gábor 2019: Nem mind arany, ami fénylik – hamisítások az ásványtudományban és -kereskedelemben (All that glitters is not gold – forgeries in the science and trade of minerals). – *In Tardy, János (ed.):* Csalások, csúsztatások, csalafintaságok a tudományban (Fraud, misinterpretation and cunning in science). Abstracts. Magyar Természettudományi Társulat (Hungarian Natural Science Society), Budapest, 15–17.

Papp, Gábor & Topa, Boglárka Anna 2018: A Bárdossy György bauxitteleptani gyűjtemény és a hozzá kapcsolódó digitalizálási munkák (The "György Bárdossy collection of samples from bauxite deposits", and the related digitization activities). – *Annales Musei historico-nationalis hungarici*, **110**: 45–68.

Viczián, István 2019: Szász József (1782-1812) kéziratos ásványtani táblázatai a Teleki Tékában (Hand-written mineralogical tables in the Teleki Téka Library, compiled by József Szász (1782-1812), abstract). – EMT XII. Tudomány- és Technikatörténeti Konferencia (XIIth Conference on History of Science and Technology, Hungarian Technical Scientific Society of Transylvania, Temesvár (Timişoara, Romania), 2019. 36-37.

Viczián, István 2019: Szász József ásványtani témájú iratai a marosvásárhelyi Teleki Tékában (Papers relating mineralogy by József Szász in the Teleki Library, Marosvásárhely, abstract). – XXI. Székelyföldi Geológus Találkozó (XXIst Meeting of Geologists of Székely Land), Szováta (Sovata, Romania), 2019. 52-54.

István Viczián and Éva Zsadányi

ITALY

The highlights of the INHIGEO activities in Italy were the organization of two international conferences: a session on the history of stratigraphy at the 3rd International Congress on Stratigraphy (STRATI 2019, Milan 2-5 July 2019), titled *History of Stratigraphy in Italian environments (17th – 20th centuries)* sponsored by INHIGEO - convener Ezio Vaccari, with co-conveners Andrea Candela, Marco Pantaloni and Luigina Vezzoli (all INHIGEO members). The organization of the 44th INHIGEO Symposium in Varese and Como (2-12 September 2019) chaired by Ezio Vaccari with other INHIGEO Italian members (Arena, Candela, Principe, Mosca, Pantaloni, Vezzoli, Console) in the local organizing committee. Moreover, as usual, the scientific activities of the Italian members included publications, participations to international symposia and national meetings, involvement in research projects and exhibitions, as well as teaching in the field of the history of the Earth sciences.

Libera Paola ARENA (Center for the History of Mountains, Material Culture and Earth Sciences, University of Insubria, Varese) contributed to the local organization of the 44th INHIGEO Symposium in Varese - Como and in particular to the *Field Trip Guidebook*, with her research on the reconstruction of the geo-historical routes around Varese made on 28 September 1878 by some Italian naturalists after the meeting of the Italian Society of Natural Sciences.

Publications:

Arena L.P. [with M. Faccioli], *A guide to the 1878 excursion in the Valceresio Valley*, in E. Vaccari, A. Candela, M. Faccioli (eds.) *Inhigeo 2019 Field Trip Guidebook*, Gallarate (Varese), A. Borghi, 2019, pp. 17-47.

Andrea CANDELA (University of Insubria, Varese) continued his research on the history of geology, still focusing his studies both on the relationship between the history of uranium and nuclear energy and on the figure of the Italian geologist Scipione Breislak (1750-1826). He also contributed to the local organization of the 44th INHIGEO Symposium in Varese - Como and in particular to the editing of the *Field Trip Guidebook.*

Conferences:

In 2019, he was among the co-organizers of a relevant international conference on the history of Geology, entitled *History of Stratigraphy in Italian environments, 17th-20th centuries*, and where he presented the lecture: *Geohistory and history of stratigraphy in the "Introduzione alla Geologia" by the "Huttonian" geologist Scipione Breislak (1750-1826)*. The conference, held in Milan (Italy), was among the sessions of the 3rd International Congress on Stratigraphy (STRATI, 2–5 July). He was also a member of the organizing and scientific committee of the 44° Inhigeo Symposium (Varese–Como, Italy, 2-12 September). During the Symposium, he discussed the oral presentation: *Visualizing the theory of the Alps: the first geological map of the Western Lombard Prealps by Christian Leopold von Buch (1829)*.

Publications:

Candela A., *The early stages of uranium geology in post-WWII Italy*, "Earth Sciences History", 38(1), 2019, pp. 137-149.

Candela A., *Geological overview and mineral deosits in the Prealps of Varese / The Cava Bonomi (Cuasso al Monte) and the granofiro quarries in Valceresio Valley*, in E. Vaccari, A. Candela, M. Faccioli (eds.) *Inhigeo 2019 Field Trip Guidebook*, Gallarate (Vaese), A. Borghi, 2019, pp. 56-70.

Candela A., *A mining Park in Valsassina Valley*, in E. Vaccari, A. Candela, M. Faccioli (eds.) *Inhigeo 2019 Field Trip Guidebook*, Gallarate (Varese), A. Borghi, 2019, pp. 88-97.

Luca CIANCIO (University of Verona), continued his research on the history of early modern geology and meteorology.
Publications:

Ciancio, L., *«Tu enim disciplinarum omnium eruditissimus». Lettere dedicatorie a Bernardo Cles in opere di medicina e astronomia (1524-1539)*, in A. Quaranta, G. Ciappelli (a cura di), *Medicina e sanità in Trentino nel Cinque-Seicento tra saperi, società e scambi culturali*, Università degli studi di Trento, Dipartimento di Lettere e Filosofia, 2019 , pp. 25-53.

Ciancio, L., *Inventari di mondi scomparsi. Il ruolo della storiografia nella valorizzazione delle collezioni scientifiche storiche*, "Atti della Accademia Roveretana degli Agiati. Classe di Scienze Matematiche, Fisiche e Naturali", vol. 269 , n. VIII/, 2019, pp. 131-144.

Ciancio, L., *Torelli, Giuseppe*, in *Dizionario biografico degli italiani* , 96 , Roma, Istituto dell'Enciclopedia Italiana, 2019, pp. 243-245.

Fabiana CONSOLE (Library – ISPRA, Rome) continued her research on the history of geological sciences, with particular attention to historical geological maps, history of Geological Survey of Italy and biographies of geo-scientists in particular biographies of the past Presidents of the Geological Society of Italy for the Society website. In 2019 she continued the digitizing, cataloguing and archiving of the historic geological maps maintained in the Library of the Geological Survey of Italy – ISPRA. In this framework, a multidisciplinary working group realized a specific page on the Geological Survey of Italy portal dedicated to the visualization on web-GIS of a series of historical geological and geothematic maps. She worked to the project of the "Geological memory sites in the Latium region (Italy)", in cooperation between Geological Survey of Italy-ISPRA, the Regione Lazio and the Città Metropolitana di Roma Capitale, aimed to the characterization of sites with geological peculiarity closely linked to events or specificities in the heritage, history and culture of the places. In cooperation with Sapienza Rome University and the Ripi Energy Museum, she started a research activity on History of oil research in Central and Southern Italy in XIX-XX centuries. Following a donation by the Library of University of Austin – Texas, in collaboration with the Bologna University, she classified and ordinated the Costantino Faillace Archive, containing technical and scientific letters, reports on Italian mining sites (hydrocarbons). In recognition of a donation made by his daughter, the collection was named the Adriano Caperle Archive (1947-1970), containing technical reports on uranium researches in Italy and abroad.

Conferences:

In March, she participated at a seminar on "The history of geological cartography in Italy" in Turin University, presenting a note on "History of geological cartography in Italy : the Cartographical collection of ISPRA library ".

In April, in the framework of the ISPRA GeoDay dedicated to the Earth Sciences, she organized a cartographic exhibition dedicated to historical geological and geothematic maps of the Cartographic archive of the ISPRA Library.

In July she participated to the Session ST.1.1"History of Stratigraphy in Italian environments (17th – 20th centuries)", at the 3rd International Congress on Stratigraphy (STRATI 2019), Milan (Italy), 2-5 July as a coauthor (with M. Pantaloni, F.M. Petti and M. Tropeano) of the paper *The historical evolution of the geological knowledge about the UNESCO Matera area (Southern Italy).*

In September, she participated at the 44th Symposium of the International Commission on the History of Geological Sciences held in Varese & Como (Italy), 2-12 September., with a poster presentation (co-author S. Fabbi) on *Bonaventura Montani: a forgotten pioneer of Italian Geological Mapping.*

In September, she co-organize a field trip dedicated to the geological studies made in XIX century by Romolo Meli on the Southern Latium coast (Anzio).

In October, she organized a seminar and a field trip dedicated to the presentation of the geological map of the park (historical maps) and the history of geological researches in the Natural park Simbruini area.

She participated to the Science Week at RomaTre University with a presentation on the *History of geology and cartography in the Roman area*.

Starting from November, she organized and participated to the series of conferences dedicated to the relation between Geology and History, in cooperation with Società Geografica Italiana, SIGEA, and ISPRA.

In December she participated in Massa Carrara at the celebration of the 100th anniversary of the establishment of the Mining High School "Bernardino Lotti" and she presented a note on the figure of Lotti geologist and cartographer.

Publications:

Pantaloni M., Console F, *Il Ponte sfondato sul torrente Farfa*. "Rend. Online Soc. Geol. It.", 47, 2019, pp. 162-177.

Pantaloni M., Console F., Petti F.M. & Tropeano M., *The historical evolution of the geological knowledge about the UNESCO Matera area (Southern Italy).* 3rd International Congress on Stratigraphy (STRATI 2019), 2-5 July 2019, Milan (Italy). Abstract Book, p. 29. (https://doi.org/10.3301/ABSGI.2019.04)

Moretti M., Lisco S., Brandano M., Tomassetti L., Gravina M.F., Pantaloni M., Console F., *The Sabellaria bioconstructions and their Plio-Pleistocene substratum along the southern Latium coast (Tor Caldara, Anzio, Italy)*. *In*: M. Vigliotti, M. Tropeano, V. Pascucci, D. Ruberti, L. Sabato (Eds) *Field Trips – guide book*, 34th IAS Meeting of Sedimentology, Rome (Italy) September 10-13, 2019, Post-Meeting Field Trip IM6, Associazione Italiana di Geologia del Sedimentario - GeoSed, Siena (Italy), pp. 223-234.

Console F., Fabbi S., *Bonaventura Montani: A forgotten pioneer of Italian Geological Mapping*. 44th Symposium International Commission on the History of Geological Sciences, Università dell'Insubria, Varese-Como, 2-12 September 2019, Program and Book of Abstracts, Gallarate (Varese), A. Borghi, p. 79.

Congi M.P., Console F., Pantaloni M., Ventura R., *Cartografia geologica storica del Lazio: dall'archivio digitale alla visualizzazione su portale*. Atti del convegno ASITA, novembre 2019, Trieste, 2019, pp. 295-302.

Pietro CORSI (Oxford University) continued his research on history of geological sciences particularly in the 19th century, as well as on the history of evolutionary theories and public opinion.

Publications:

Corsi P., *From the Museum pictum to the specimen in Museums: Conclusions*, "Passés Futurs Revue", n. 6, 2019, *Showcasing Humanity* (https://www.politika.io/en/passes-futurs)

Corsi P., *Charles Darwin. Antologia di testi*, Roma, Carocci, 2019, 340 pp.

Corsi, P., *A Chair for Two: G. Cuvier and J.-C. Delamétherie et the Collège de France*, pre-print (March 2019), DOI: 10.13140/RG.2.2.24530.40648

Francesco GERALI (Visiting Research Scholar, University of Oklahoma School of Library and Information Studies, Norman, OK, USA / Honorary Research Fellow, University of Western Australia FABLE, School of Humanities, Perth, WA, Australia) on March and April, 2019, collaborated (thanks to the endorsement of INHIGEO members Fabiana Console and Marco Pantaloni) with the Library & Information Center of the government agency ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale (Institute for the Environmental Protection and Research) in Rome to reorganize and create a new archival unit for the documentary holdings related to historical petroleum geology and exploration in Italy.

Between March and December, Francesco was advisor and provided contents to James Douet (The International Committee for the Conservation of the Industrial Heritage, TICCIH) for the edition of the report *The Heritage of the Oil Industry: TICCIH Thematic Study* (https://ticcih.org/wp-content/uploads/2020/05/Oil-industry-thematic-report.pdf).

In May, Francesco was appointed (two-year term) *Contributing Editor* for the "ISIS Current Bibliography of the History of Science". Contributing editors are coordinated by Head Bibliographer Stephen Weldon (University of Oklahoma History of Science), to collect titles in a specific field of expertise. Francesco's contribution focuses on the works authored by the members of the International Committee on the History of the geosciences (INHIGEO).

From May to July, Francesco was *The 2019 Elizabeth & Emerson Pugh Young Scholar in Residence* at the IEEE History Center, Stevens Institute of Technology, Hoboken, NJ, USA and worked on his research proposal *Popular Oil: Contributions on the Oil & Gas Industry History for the Engineering and Technology History Wiki (ETHW)*. The resources and support granted by the members of the IEEE History Center allowed to create 30 entries for the subcategory *Petroleum*, which covers historical subjects on petroleum upstream, midstream and downstream. Four of those entries concern the interconnections between electrical engineering applied to petroleum exploration. In agreement with the IEEE History center staff, Francesco prepared 4 reference tools: Terminology, Glossary, Acronyms and a Bibliography. The latter includes a specific section (200 references) on petroleum and electricity. Through this result, now the ETHW can be also considered an educational tool useful for scholars in the humanities, sciences, and industry practitioners interested in the history of science, technology and engineering of the petroleum industry.

In September, together with Federico Varazi (Museum Director), Lorenzo Lipparini (University of Rome "La Sapienza"), Roberto Bencini (University of Bologna) and Elio Bianchi (Consultant Geologist), Francesco is founding member of the Scientific Committee of the Museo dell'Energia (Energy Museum) of Ripi. He is Research Coordinator for the historical research activities related to the petroleum explorations developed in Ripi from the 1860s to the 1950s.

Grants:
The Elizabeth & Emerson Pugh Young Scholar in Residence at the IEEE History Center 2019. IEEE History Center, Stevens Institute of Technology, Hoboken, New Jersey, USA.

Professional Service:
Program Committee Officer for the 52st ICOHTEC Meeting, Eindhoven, The Netherlands, 2020.
Board Officer of the International Committee for the History of Technology (ICOHTEC) with the appointment of *Newsletter Editor* (2017-2021)
Speaker for the *miniGeology Radio Show* presented by Daniel Minisi (Regional Geologist, SHELL USA) aired by the KPFT Radio Station of Houston. Invited to present a one-hour show on the history of the petroleum industry.

Professional development courses:
02/2019 Special Library Association - Europe Chapter. *Career Stories - Working internationally.*
06/2019 Special Library Association - Europe Chapter. *What is the blockchain and what can it do for you?*

Publications:
Gerali, F. *An historical overview over the development of the drilling mud fluids technology in Europe and the United States.* "De Re Metallica" 33, 2019, pp. 75-86. [Special thematic issue *Historia de la Exploración y Explotación del Petróleo en España* edited by Ester Boixereu, Alicia Arenillas & Octavio Puche, eds., Madrid, Sociedad Española para la Defensa del Patrimonio Geológico y Minero, 2019.]
Gerali F., 30 entries for the Category *Energy* - Subcategory *Petroleum* in the Institute of Electrical and Electronics Engineer's *Engineering and Technology History Wiki*:
Acronyms of Petroleum Related Terms: (https://ethw.org/Acronyms_of_Petroleum_Related_Terms)
Barrel (Unit of Measurement) (https://ethw.org/Barrel_(Unit_of_Measurement)
Darcy's Law (https://ethw.org/Darcy%27s_Law)
Dipping Needle (https://ethw.org/Dipping_Needle)
Drilling Fluids (https://ethw.org/Drilling_Fluids)
Electromagnetic Teleclinometer (https://ethw.org/Electromagnetic_Teleclinometer)
Ethanol (https://ethw.org/Ethanol)
Gasoline (https://ethw.org/Gasoline)
Abraham Gesner (https://ethw.org/Abraham_Gesner)

Glossary of the Technical Terminology Used in the Petroleum Industry, 1890-1950
(https://ethw.org/Glossary_of_the_Technical_Terminology_Used_in_the_Petroleum_Industry,_1890_-_1950)
Hydraulic Fracturing (https://ethw.org/Hydraulic_Fracturing)
Jet Fuel (https://ethw.org/Jet_Fuel)
Samuel Martin Kier (https://ethw.org/Samuel_Martin_Kier)
List of Petroleum History Museums (https://ethw.org/List_of_Petroleum_History_Museums)
Petroleum Engineering (https://ethw.org/Petroleum_Engineering)
Petroleum Historical Bibliography (https://ethw.org/Petroleum_Historical_Bibliography)
Petroleum Historical Terminology (https://ethw.org/Petroleum_Historical_Terminology)
Petroleum Storage Tanks (https://ethw.org/Petroleum_Storage_Tanks)
Petroleum Transportation Tanks (https://ethw.org/Petroleum_Transportation_Tanks)
Pump Jacks (https://ethw.org/Pump_Jacks)
Thomas Boverton Redwood (https://ethw.org/Thomas_Boverton_Redwood)
Slips and Jars (https://ethw.org/Slips_and_Jars)
Spring Poles (https://ethw.org/Spring_Poles)
Synthetic Fuels (https://ethw.org/Synthetic_Fuels)
Thermal Cracking (https://ethw.org/Thermal_Cracking)
Torpedoes (Well shooting) (https://ethw.org/Torpedoes_(Well_shooting))
Torsion Balance (https://ethw.org/Torsion_Balance)
Walking Beams (https://ethw.org/Walking_Beams)
Well Logging (https://ethw.org/Well_Logging)

Newsletters Edited:
Gerali, Francesco. 2019. *ICOHTEC Newsletter* issues 159 to 165 (http://www.icohtec.org/w-publications/w-publications-newsletter/).

Contributions to not peer-reviewed publications:
Gerali, Francesco. "INHIGEO Virtual Bibliography: Armenia, Austria, Chile, France, Germany, Hungary, and India." *INHIGEO Annual Record* n°51 (2019): 149-206.

Multimedia and Popular Science:
Gerali, Francesco. 2018. Talks for the "miniGeology Radio Show", the KPFT Radio Station, Houston, TX, USA.
Show #71 *History of information on Petroleum,* https://youtu.be/64RxB8MBgcQ
Show #81 *History of Petroleum in Russia*, https://youtu.be/96QzD2dlG2c

Francesco LUZZINI (Max Planck Institute for the History of Science, Department I MPIWG - Berlin, Germany). As Affiliate Scholar of MPIWG he is member of the Anthropocene Research Group (https://www.mpiwg-berlin.mpg.de/project/earth-making). Currently, he is especially interested in evaluating how different streams of theoretical and practical knowledge interacted in early modern Europe and how this cross-pollination of methods, theories and experiences influenced the action of humans as geological and environmental agents. This issue is the core subject of his new research project *Sounding the Depths of Providence*, which he (very much) hopes to implement in the upcoming years. A first important step in this direction was the award in October of a Mellon Fellowship at the History of Science Collections of the University of Oklahoma (to take place in January-April 2020).

In 2019, Francesco continued serving as Contributing Editor for *IsisCB*, the *Isis* Current Bibliography of the History of Science. As Special Editor for Italian language sources, in January 2019 he published the essay "Bibliographical Distortions, Distortive Habits: Contextualizing Italian Publications in the History of Science" (https://www.journals.uchicago.edu/doi/pdfplus/10.1086/702660).

In providing an account of Italian scholarship in the history of science, this article discusses how the overlapping of several factors (the different scholarly traditions, the reform of the academic recruitment system launched in 2010, the obsessive use of metrics in research evaluation, the imposition of absurdly rigid disciplinary boundaries, and rampant clientelism and nepotism) has caused severe distortions in the way scholarly works are produced and valued in Italian academia – including, unfortunately, the history of the Earth sciences.

In late September, Francesco finished his Research Fellowship at the Museum of Sciences in Trento (MuSe), where he worked on a project on the scientific and cultural discovery of the Dolomites in the XIX century. The main fruit of this research work will be a critical edition of the first manuscript volume (1820-1875) of the guestbook of the Hotel *Nave d'Oro* in Predazzo (Italy), where travelers from all over the world left their signatures and a number of historically and scientifically significant notes related to the exploration of the Dolomites. The volume is expected to be published in 2021.
In 2019, Francesco served his fourth year as Councilor for the journal *Earth Sciences History* (http://www.historyearthscience.org). He is also History of Science Editor of the journal *Il Protagora* (http://mimesisedizioni.it/riviste/il-protagora.html) and Scientific Manager of the Digital Archive of Antonio Vallisneri's Correspondence (http://www.vallisneri.it/inventario.shtml).

Conferences:
- Book presentation (April 2): *Giovanni Pietro Orelli Barbaba di Locarno: Opera Medica (1711)* (Cantonal Lyceum of Bellinzona, Switzerland)
- Book presentation (May 4): *Theory, Practice, and Nature In-between. Antonio Vallisneri's Primi Itineris Specimen,* Berlin, Edition Open Access/MPIWG, 2018 (Rocca dei Boiardo, Scandiano, Italy)
- Meeting (June 14): Scientiae Conference 2019 (Belfast) Paper: *Inversi Arboris Instar: (Re)generative Theories and Botanical Analogies In the Early Modern Debate on Mineral Ore*
- Workshop (July 27-28): IsisCB Workshop 2019 (Utrecht)
- Meeting (September 20): *Variable Matters: Materia Medica in the Eighteenth-Century World* (University of Basel) Paper: Naturae Consilio. *Earthly Substances, Medicine and Therapeutics in Vallisneri's Research*
- Workshop (November 26): *Cosmologies of Resource Transformation in the Early Modern Period* (Collaborative Research Center 980, Berlin)

Publications:

- Luzzini, F., “Bibliographical Distortions, Distortive Habits: Contextualizing Italian Publications in the History of Science,” *Isis,* Vol. 109, n. S1 (Isis 2018 Current Bibliography), pp. 3-13.
- Luzzini, F., *Quando il Cannaregio si fece dolce*, "Acque Sotterranee, Italian Journal of Groundwater", n. 2 (2019), pp. 75-77. Forthcoming
-Luzzini, F., (*Re)shaping a method. Field Research and Experimental Legacy in Vallisneri’s "Primi Itineris Specimen"*, in *Mapping the Territory. Exploring People and Nature 1700-1830,* ed. S. Boscani Leoni, Leiden, Brill.
-Luzzini, F., *Distorsioni bibliografiche e storture etiche. Le pubblicazioni di storia della scienza nel contesto italiano*, "Il Protagora", XLV, nn. 29-30.
-Luzzini, F., “Sounding the Depths of Providence: Mineral (Re)generation and Human-Environment Interaction in the Early Modern Period,” *Earth Sciences History,* Vol. 38, n. 2.

Stefano MARABINI (Faenza) continued to study the history of geology and seismic activities in the Romagna region (central Italy), as well as geological heritage, and to collaborate with the Museum Scarabelli in Imola and Museum Capellini at the University of Bologna. He is also working at a research project for completing a new geological map of the Imola hills in Emilia-Romagna region, working in particular on the 'yellow sands' of Imola studied by Giuseppe Scarabelli (1820-1905).

Pietro MOSCA (Institute of Geosciences and Earth Resources, CNR - Italian National Research Council, Turin) continued his research on the history of the geologic studies of the western Alps (notably during 19th and 20th centuries) and about the role exerted by geology and geo-morphological features in the human history. He also contributed to the organization of the 44th INHIGEO Symposium in Italy, as a member of the Organizing and Scientific Committee, leading in particular the final part of the post-meeting fieldtrip in Turin and Susa Valley (10-12 September 2019).

Conferences:

Organization of a meeting / seminar about the history of geological cartography in Italy (8 March 2019, Turin, Italy) with the following talks:

Mosca P., Barale L. and Fioraso G. - *The Geological Map of the Western Alps (1908): an inestimable document of the Italian geologic cartography*; Pantaloni M. - *History of geology and geological cartography in Italy* / Console F. - *The geological maps of the ISPRA library*.

(with Gambino F., Barale L., Borghi A,, D'atri A., Martire L.), *A geo historical tour through the city of Torino and the Susa Valley (NW Italy)*, 44th INHIGEO Symposium (2-12 September 2019, Varese and Como, Italy).

Publications:

Gambino, F., Barale L., Borghi A. and Mosca P., *Tourinstones, field trip in a stone town*, in E. Vaccari, A. Candela, M. Faccioli (eds.) *Inhigeo 2019 Field Trip Guidebook*, Gallarate (Varese), A. Borghi, 2019, pp. 107-153

Maddalena NAPOLITANI (École Normale Supérieure, Paris) as a PhD candidate in history of art at the École Normale Supérieure within the doctoral program SACRe-PSL (*Sciences Arts Création Recherche*, ED 540 école transdisciplinaire Lettres Sciences), she continued to work on her dissertation "*Un grand siècle de la curiosité". The re-invention of curiosity cabinets during the 19th century through the mineralogy collections of the Ecole des Mines in Paris*. The thesis focuses on the École des Mines’ mineralogy collections between the 18th and the 19th century, and especially on how collecting practices related to scientific objects were changing during the revolutionary period, from the model of the curiosity cabinet to that of the modern scientific museum. In 2019, she also continued to teach history of art at the University of Grenoble as “attaché temporaire de l’enseignement et de la recherche” (ATER).

Conferences:

In September 2019 she presented a paper with the title *« Réunir à une belle exécution artistique une grande véracité géologique » : the painted decoration of the École des Mines of Paris during the 1850s* at the 44th INHIGEO Symposium (2-12 September 2019, Varese and Como, Italy).

Publications:

Napolitani, M. *"Born with the taste for science and the arts”: The science and the aesthetics of Balthazar-Georges Sage's mineralogy collections, 1783–1825*, "Centaurus", 60 (4), November 2018, (Special Issue: *Skulls and Blossoms: Natural History Collections and their Meanings*, published in August 2019), pp. 238-256.

Napolitani, M. *L'expédition en Sibérie de Jean-Pierre Alibert (1844-1857): l'exploitation du graphite entre art et science* (working paper published by LUHCIE - Laboratoire Universitaire Histoire Cultures Italie Europe, Université Grenoble-Alpes, December 2019: https://luhcie.univ-grenoble-alpes.fr/wp-content/uploads/2019/06/NAPOLITANI-Maddalena.pdf).

Pietro Daniel OMODEO (University of Venice "Ca' Foscari") continued his research on the history of the hydrogeology of Venice Lagoon. He is also working on a new project - financed by the Italian Ministry of University and Research - about the Venice Lagoon hydrogeology during the Renaissance, with particular attention to the works by Cristoforo Sabbadino and Benedetto Castelli.

Conferences:
- in September he presented a paper (with S. Trevisani and S. Babu) with the title *Geoenvironmental Management in Renaissance Venice: When a Galilean Mathematician tried to solve the hydrogeological problems of the Lagoon*, at the 44th INHIGEO Symposium (2-12 September 2019, Varese and Como, Italy).

Publications:
Omodeo, P.D., Renn, J., *Science in Court Society: Giovanni Battista Benedetti's Diversarum speculationum mathematicarum et physicarum liber (Turin, 1585)* , Berlin, Edition Open Access, 2019
Omodeo, P.D., *Practices and Theories of Contingency in Renaissance Approaches to Nature*, in *Contingency and Natural Order in Early Modern Science*, Boston, Springer, 2019, pp. 93-114.
Omodeo, P.D., *Telesio and the Renaissance Debates on Sea Tides* in Omodeo, P. D.(editor), *Bernardino Telesio and the Natural Sciences in the Renaissance*, Leiden, Brill, 2019, pp. 116-145.
Omodeo, P.D., Wels, V. (editors), *Natural Knowledge and Aristotelianism at Early Modern Protestant Universities*, Wiesbaden, Harrassowitz, 2019.

Marco PANTALONI (Geological Survey of Italy - ISPRA, Rome, Italy) - continued his research on the history of geological sciences, with particular attention to history of geological mapping, history of Geological Surveys and biographies of geoscientists. He continued the coordination of the "History of Geoscience working group" of the Geological Survey of Italy - ISPRA and maintained the role of coordinator of the "History of Geoscience Section" of the Geological Society of Italy.
He continued his collaboration with the Treccani Italian Encyclopaedia for the redaction of biographies of Italian geologists and the biographies of the past Presidents of the Geological Society of Italy for the Society website. He continued the digitizing, cataloguing and archiving of the historic geological maps and archive maintained in the Library of the Geological Survey of Italy – ISPRA. In this framework, a multidisciplinary working group realized a specific page on the Geological Survey of Italy portal dedicated to the visualization on web-GIS of a series of historical geological and geothematic maps.

He coordinate the "Geological memory sites in the Latium region (Italy)" project, in cooperation between Geological Survey of Italy-ISPRA, the Regione Lazio and the Città Metropolitana di Roma Capitale, aimed to the characterization of sites with geological peculiarity closely linked to events or specificities in the heritage, history and culture of the sites. In cooperation with Sapienza Rome University and the Ripi Energy Museum, started a research activity on History of oil exploration and production in Central and Southern Italy in XIX-XX centuries.

Following a donation by the University of Austin – Texas, in collaboration with the Bologna University, he ordinated the archive of Costantino Faillace, containing technical and scientific reports on Italian mining sites. For a donation made by his family, was ordinated also the Adriano Caperle archive, containing technical reports on uranium researches in Italy and abroad.

Conferences:
In the month of March, he lectured in a specialization course for the High Specialization and Research Heritage School for the Italian Ministry of Cultural Heritage.
In March, he participated at a seminar on "The history of geological cartography in Italy" in Turin University, presenting a note on "History of geology and geological cartography in Italy".
In May he organized the conference "1969-2019 – Bruno Accordi e la scuola geologica romana: l'idrogeologia dell'alto bacino del Liri", dedicated to the 50th anniversary of the publication on the geology of Central Italy, held at Sapienza Università di Roma, 31 May.

In April, in the framework of the ISPRA GeoDay dedicated to the Earth Sciences, he organized a geological tour dedicated to the ancient building stones into the San Paolo fuori le Mura Basilica in Rome, and a cartographic exhibition dedicated to historical geological and geothematic maps of the Cartographic archive of the ISPRA Library.
In June, he attended the seminar "Convegno divulgativo sul patrimonio storico e artistico della nazione", at the Teatro San Michele Arcangelo in Montopoli in Sabina (RI), presenting a note on "Il Ponte sfondato sul Torrente Farfa".
He co-organized the 13th International Conference on Military Geology: "Peace follows war: geosciences, territorial impacts and post-conflict reconstruction" held in Padua from 24 to 28 June.
In July he co-organized the Session ST.1.1 "History of Stratigraphy in Italian environments (17th – 20th centuries)", at the 3rd International Congress on Stratigraphy (STRATI 2019), Milan (Italy), 2-5 July.
In September, he participated at the 44th Symposium of the International Commission on the History of Geological Sciences held in Varese & Como (Italy), 2-12 September.
In September, he co-organized a field trip dedicated to the geological studies made in XIX century on the Southern Latium coast (Tor Caldara, Anzio).
In October, as coordinator of the collaboration with the Simbruini Natural Park, he organized a seminar and a field trip dedicated to the presentation of the geological map of the park and the history of geological researches in the Simbruini Mounts area.
He participated to the Science Week at RomaTre University with a presentation on the "History of geology and cartography in the Roman area".
Starting from November, he organized and participated to the series of conferences dedicated to the relation between Geology and History, in cooperation with Società Geografica Italiana, SIGEA, and ISPRA.

Publications:

Pantaloni, M., Console, F., *Il Ponte sfondato sul torrente Farfa.* "Rend. Online Soc. Geol. It." 47, 2019, pp. 162-177.

Pantaloni, M., Lucarini, M., Guarino, P.M., Spizzichino, D., Leoni, G., *Le pietre ornamentali della Basilica di San Paolo fuori le mura. GeoDay*, ISPRA, 10 Aprile 2019, Roma.

Pantaloni M., Agrillo E., Casella L., Console F., Crosti R., D'Orefice M., Fabbi S., Falcetti S., Martarelli L., Pichezzi R.M., Roma M., *I Monti Simbruini: un osservatorio geologico-ambientale privilegiato nel territorio del Lazio.* Field trip guide, ISPRA-SNPA, Roma, 2019, pp. 35.

Bondesan A., Craig D., Pantaloni M., Petti F.M., Plini OP., Smit H (eds.), *13th International Conference on Military Geology: Peace follows war: geosciences, territorial impacts and post-conflict reconstruction*, Abstract volume. 2019 (DOI: 10.3301/ABSGI.2019.03).

Pantaloni M., Console F., Petti F.M. & Tropeano M., *The historical evolution of the geological knowledge about the UNESCO Matera area (Southern Italy).* 3rd International Congress on Stratigraphy (STRATI 2019), 2-5 July 2019, Milan (Italy). Abstract book, 29. (https://doi.org/10.3301/ABSGI.2019.04)

Moretti M., Lisco S., Brandano M., Tomassetti L., Gravina M.F., Pantaloni M., Console F., *The Sabellaria bioconstructions and their Plio-Pleistocene substratum along the southern Latium coast (Tor Caldara, Anzio, Italy). In:* M. Vigliotti, M. Tropeano, V. Pascucci, D. Ruberti, L. Sabato (Eds) *Field Trips – guide book, 34th IAS Meeting of Sedimentology,* Rome (Italy) September 10-13, 2019, Post-Meeting Field Trip IM6, Associazione Italiana di Geologia del Sedimentario - GeoSed, Siena (Italy), 2019, pp. 223-234.

Pantaloni M, *The 1:1M Geological Map of Italy: a milestone in geological knowledge*. In 44th Symposium International Commission on the History of Geological Sciences, Università dell'Insubria, Varese-Como, 2-12 September 2019, Program and Book of Abstracts, pp. 61-62.

Congi M.P., Console F., Pantaloni M., Ventura R., *La cartografia geologica storica del Lazio: dall'archivio digitale alla visualizzazione su portale*. Atti del convegno ASITA, novembre 2019, Trieste, 2019, pp. 295-302.

Pantaloni M., "Trener, Giovanni Battista". In *Dizionario Biografico degli Italiani*, Roma, Enciclopedia Treccani. vol. 96, 2019

Pantaloni M., "Tenani, Mario". In *Dizionario Biografico degli Italiani*, Roma, Enciclopedia Treccani. vol. 95, 2019

Pantaloni M., "Taricco, Michele". In *Dizionario Biografico degli Italiani*, Roma, Enciclopedia Treccani. vol. 95, 2019

Pantaloni M., "Stella, Augusto". In *Dizionario Biografico degli Italiani*, Roma, Enciclopedia Treccani. vol. 94, 2019.

Pantaloni M., "Viola, Carlo Maria". In *Dizionario Biografico degli Italiani*, Roma, Enciclopedia Treccani. (in press)

Claudia PRINCIPE (Institute of Geosciences and Earth Resources, CNR - Italian National Research Council, Pisa) continued her researches in the history of volcanology and geo-archaeology, as well on the history of the earth sciences in the early meetings of Italian scientists.

Conferences:

"Vesuvio 79 AD - L'eruzione che ha cambiato la vulcanologia", conference within the series of seminars "I giovedì della Cittadella", Cittadella Galileana, Pisa (Italy), 17 October 2019.

Speaker at the round table "Metodo Scientifico e sua Attualità" within the series of conferences "A tu per tu con gli scienziati – Metodo □□□□□□□□□□: le vie della conoscenza" organized by Associazione Briciole and by La Nuova Limonaia, I.I.S. A. Meucci, Massa (Italy), 8 May 2019.

"The contribution of the *Riunioni degli Scienziati Italiani* (Congresses for Italian Scientist) to the circulation of the Geological Ideas, and as part of the process of unification of Italy" – Invited Oral presentation, 44th INHIGEO Meeting (2-12 September 2019) Como-Varese.

(with A. Paolillo) "The Contribution of Historical Data to Cartography of Active Volcanoes. The Example of Vesuvius – Oral presentation – IUGG Montreal Canada (8-18 July 2019)

"The contribution of Henry James Johnston-Lavis to the Monte Somma and Vesuvius Stratigraphy and cartography" – Oral presentation – STRATI 2019 Milano (2-5 July 2019)

"CORVO: A Corpus of annotated texts about phenomenology of European Volcanoes - an EUROVOLC/EPOS project" – Oral presentation – EUROVOLC M12 Annual meeting, Azores Islands (17-22 February 2019).

Publications:

Vezzoli L.M., Principe C., *Monte Amiata volcano (Tuscany, Italy) in the history of Volcanology: 1 - Its role in the debates on extinct volcanoes, source of magma, and eruptive mechanisms (AD 1733-1935)*. In press on "Earth Science History", 31 October 2019.

Guido ROGHI (Institute of Geosciences and Earth Resources, CNR - Italian National Research Council, Padua), continued his research work on paleontologist Abramo Massalongo (1824-1860), in collaboration with the Accademia di Agricoltura, Scienze e Lettere di Verona, as well as the study of the field notebooks of geologist Achille De Zigno (1813-1892), in collaboration with his descendant, Alberto Lonigo. The project to scan and digitize De Zigno's notebooks is in progress. In July and August, as part of the research activity on the fieldwork of some 19th century geologists in the Alps, he undertook excursions on the Canzoccoli locality and at the Rifugio Taramelli. He also contributed to the first Italian translation of the book: *Monographie der Dolomitenstrasse* by Carl Felix Wolff, 1908.

On 31 May 2019 he organized at the Department of Geosciences, University of Padova (Italy) a meeting on the scientific heritage of geologist Tommaso Antonio Catullo (1782-1869).

Conferences:

Dall'inchiostro ai Raggi X: le Scienze della Terra per immagini dal passato ad oggi. Darwin Day, Museo di Storia Naturale, Milano (Italy), 12-13 February 2019

The geological travels of Achille De Zigno in the Dolomites during the spring of the 1846. International Congess of Stratigraphy - STRATI, Milano (Italy), 2-5 July 2019.

Quando i vulcani diventano antichi, 200 anni fa, Giuseppe Marzari-Pencati rivoluziona la teoria della Terra, Museo di Geologia di Predazzo, Literary Review organized by the Geological Museum of Predazzo, together Trento Film Festival and the curatorof the exibition: "10 libri per raccontare le Dolomiti". Predazzo (Trento, Italy), 31 July 2019.

Presentation of the book *La grande strada delle Dolomiti* (Italian translation of *Monographie der Dolomitenstrasse* by Carl Felix Wolff, 1908) published by Nuovi Sentieri Editore and Istitut Cultural Ladin in 2019. Museo di Storia Naturale, Venice (Italy), 14 December 2019.

Marco ROMANO (Sapienza, University of Rome) continued his research in the history of geology focusing in particular on Italian authors between the thirteenth and fifteenth centuries. The research has brought to light for the first time the geological elements traceable in the work of Leon Battista Alberti, Italian architect who manages to reconcile in a harmonious way the innovations made by Brunelleschi, Masaccio and Donatello, fully embodying the spirit of the Florentine Renaissance, where art presupposes a profound understanding of nature and not its simple imitation in artist works.

In addition, he completed and submitted to publication a dissemination book (about 250 pages in length), dedicated to the birth of paleontology in Italy, from the manuscripts by Leonardo to the crucial work of Gian Battista Brocchi. The book should be published in 2020 under the patronage of the Italian Geological Society and the Italian Paleontological Society. He also finished a second dissemination book on the geological elements of Dante Alighieri Divine Comedy (Inferno), to be submitted soon.

Publications:

Romano M., *"L'uomo universale del primo Rinascimento": la geologia nel De re aedificatoria di Leon Battista Alberti*, "Rendiconti Online Società Geologica Italiana", 47, 2019, pp. 185-201.

Romano M., (book, in press). *"I Fossili una Storia Italiana. Il contributo italiano alle prime conquiste della paleontologia"*, Società Geologica Italiana.

Luca SIMONETTO (Museo Friulano di Storia Naturale, Udine) continued his work at the Museo Friulano di Storia Naturale as a laboratory technician, taking care of the geological and paleontological collections. His research in the history of geology focuses on 19th century Italian naturalists and geologists from Friuli region, like Giulio Andrea Pirona and others. He also continues to investigate some aspects of the geological and paleontological research that were carried out between the second half of the 19th century and the first half of the 20th century in the Carnic Alps.

Ezio VACCARI (University of Insubria, Varese) continued his research on the history of the geological sciences in 18th-19th century, with particular attention to stratigraphy and orogenetic theories. He also continued to teach history of geological sciences within his course of History of Mountains at the University of Insubria in Varese and Como. In July he organized (with co-conveners Andrea Candela, Marco Pantaloni and Luigina Vezzoli) a session on the history of stratigraphy at the 3rd International Congress on Stratigraphy (STRATI 2019, Milan 2-5 July 2019), titled *History of Stratigraphy in Italian environments (17th – 20th centuries)* and sponsored by INHIGEO. He also chaired the Organizing Scientific Committee of the 44th INHIGEO Symposium in Varese and Como (2-12 September 2019).

Conferences:

Symposium on Tommaso Antonio Catullo (1782-1869). University of Padua (Italy), May 2019. Paper (in Italian) on *Tommaso Antonio Catullo and 19th century geology: an historiographical overview*.

3rd International Congress on Stratigraphy (STRATI 2019), Session ST 1.1 - *History of Stratigraphy in Italian environments (17th-20th centuries)*. University of Milan (Italy), July 2019. Paper: *The development of stratigraphy in Italy between 17th and 18th century: from Steno to Arduino*.

Scientiae Annual Conference, Session on "Letters, Mobility & Connected Spaces: Mapping Communication between Naturalists", Queen's University, Belfast (UK), June 2019. Paper: *The space of a new science: from mineralogy to geology in the letters about the journey through Italy (1771-1772) by Johann Jakob Ferber*.

44th INHIGEO Symposium, University of Insubria, Varese and Como (Italy), September 2019. Paper: *Nicoletta Morello and the history of geology in Italy*.

Publications:

Vaccari, E., Faccioli M., *The Geodetic Point of Somma Lombardo - an historical overview, In :* E. Vaccari, A. Candela, M. Faccioli (eds.*), INHIGEO 2019 Program and Book of Abstracts*, 44th INHIGEO Symposium, Varese-Como (Italy), 2-12 September 2019, Gallarate, A. Borghi, 2019, pp. 37-41.

Vaccari, E., Histon K., *The Valganna Waterfall - a natural heritage from travertine, In:* E. Vaccari, A. Candela, M. Faccioli (eds.*), INHIGEO 2019 Program and Book of Abstracts*, 44th INHIGEO Symposium, Varese-Como (Italy), 2-12 September 2019, Gallarate, A. Borghi, 2019, pp. 42-43.

Vaccari, E., Candela, A., Faccioli, M. (eds.) *Inhigeo 2019 Field Trip Guidebook*, Gallarate (Varese), A. Borghi, 2019, pp. 154.

Gian Battista VAI (Museum Giovanni Capellini, University of Bologna), continued his research activity in history of geology and paleontology, as Director of the Geological Museum "Giovanni Capellini", at Bologna University, organizing exhibitions and popular conferences also on the history of geology. He is also working at the Giuseppe Scarabelli's Bicentennial Celebration, which will take place in 2020, in order to improve the knowledge and extend dissemination of Scarabelli's work, highlighting his legacy in geological studies.

Publications:

Vai, G.B., *The origin of prehistoric archaeology*, "Earth Sciences History", 38, n. 2, 2019, pp. 327-356

Vaiani, S.C., Vai, G.B., Borsetti, A.M., Sarti, C. *From Ammonites to* Ammonia, *a tale on the early history of micropaleontology by Jacopo Bartolomeo Beccari (1682-1766)*, "Micropaleontology", 65, n. 6, 2019, pp. 551-560.

Vaiani, S.C., Vai, G.B., Borsetti, A.M., *The lectotype of* Ammonia beccarii *(Linnaeus 1758) from Jacopo Bartolomeo Beccari's original sample*, "Micropaleontology", 65, n. 6, 2019, pp. 561-566.

Luigina VEZZOLI (Institute of Geosciences and Earth Resources, CNR - Italian National Research Council, Pisa) continued her research on the history of volcanologicsl studies in Italy. She also contributed, as a member of the organizing and scientific committee, to the 44th INHIGEO Symposium in Italy, leading in particular the geo-historical excursion about the building stones of the city of Como.

Publications:

A Walking Tour in Como for Historical-Scientific Heritage and Building Stones, In: E. Vaccari, A., Candela, M. Faccioli (eds.), *INHIGEO 2019 Program and Book of Abstracts*, 44th INHIGEO Symposium, Varese-Como (Italy), 2-12 September 2019, Gallarate, A. Borghi, 2019, pp. 24-36.

Ezio VACCARI (Varese)

JAPAN

The JAHIGEO (Japanese Association for the History of Geological Sciences) held as usual three meetings in 2019. The first was held at the Hokutopia, Tokyo, on 23 June; the second at Yamguchi University, Yamaguchi, on 24 September, and the third, serving as the annual meeting, at the Hokutopia on 22 December. The presentations at the first meeting were:

WAKABAYASHI Yu "Bureaucracy and Society in Weather Forecast: Toward a Historical Analysis of the Japan Meteorological Agency;" and

KIMURA Gaku "Geological Research of Hokkaido special reference to the background of its founding stage".

The second formed a session of the annual meeting of the Geological Society of Japan (JGS), newly discovered documents on the first president of Yamaguchi University, the famous geophysicist, Motonori Matuyama which were exhibited and explained by AIDA Nobuyuki.

At the third meeting, two lectures were given:

YATSUMIMI Toshifumi's "Ietake Okada and the life of Chang Ting-Chao: Politics and science among chemists in the Shanghai Institute of Natural Science" and

YAMADA Toshihiro's "How to describe the geo-history: From 'Stenonian Revolution' to 'Anthropocene (Japanese version)'", which was dedicated to the memory of 350th aniiversary of Steno's *Prodromus* (1669).

The Study Group for the History of Geosciences (*Chigaku-shi Kenkyu-kai*), organized by JAHIGEO members since 2000, had four meetings, 74th to 77th, at the Waseda Service Garden, Tokyo, on 23 March, 22 June, 19 October, and 7 December. At the March meeting, two presentations were given:

TAKEUCHI KenIchi's "The theories of river capture of terrace-dissecting valleys in Musashino Terrace,Kanto Plain: A case study of Yazawa River (Todoroki Valley)" and

HAMASAKI Kenji's "Isajiro Ando's "Phenomena of Mineral Kingdom" and Ichinokawa stibnite crystal illustrating Ando's work and other 5 books by using the same illustration".

In June, MASHIMA Hidehisa gave the lecture of "Missing link of History of Geology in Japan: Geological Institute of Kyushu University".

In October, YAMADA Toshihiro coordinated a special gathering to review the French Anthropocene book of C. Bonneuil and J.-B. Fressoz translated by NOSAKA Shiori into Japanese in 2018. First, TSURUTA Soto gave a review of "What's Wrong with the 'Anthropocene'?: From the Point of View of 'Geopower'". Then, INOKUCHI Tomohiro and YAJIMA Michiko commented about the review. Inokuchi explained the meaning of Donna Haraway's 'Chthulucene' (2016) in his presentation "In What Sense does the Geological Epoch Matter to Humanities?: On the Multiple Naming of Anthropocene". The meeting was very stimulating with active participants from both geological sciences and humanities.

In December, YAMADA Naotoshi and YAJIMA Michiko gave the lecture of "German geographer J. J. Rein's travel in Japan (1874-75) and its influence."

At the 66th annual meeting of the History of Science Society of Japan (HSSJ) was held at Gifu University, Gifu, 25-26 May, six papers were read on the history of earth and planetary sciences:

YATSUMIMI Toshifumi, "The Hibonkaku's Dictionary of Pharmacy that Japan's geochemist Ietake Okada used to store";

MIYAGAWA Takuya, "Complex Disaster in Postwar Hiroshima: War, A-bomb, Makurazaki Typhoon";

MIYASHITA Atsushi, “Science history of Japan relief map for education before WWII”;
YAJIMA Michiko, “How Edmund Naumann made the Geologic Map of Japan in 1885?”;
TAKARABE Kae, “Meteorological Observation by an *Oyatoi*, P. V. Veeder before Coming to Japan”;
YAMAMOTO Akira, “Hirotaro Tonno (1859-1898) and his private meteorological station in Yamaguchi, Japan.

A day after the HSSJ sessions, on 27 May, at the Makuhari Messe, Chiba, the Japan Geoscience Union (JpGU) provided sessions for geoscience studies: historical, philosophical and STS approaches, in which seven posters were presented:
AOKI Shigeyuki, “Cosmic skepticism on meaning of life”;
YAMADA Toshihiro, “Rethinking 'Stenonian Revolution' in stratigraphy: From *Prodromus* (1669) to ‘Anthropocene’”;
YAJIMA Michiko, “How Edmund Naumann made the Geologic Map of Japan in 1885?”,
YAMAMOTO Akira, “The role of the private sector in the formation of the meteorological observation network of Japan in the nineteenth century”;
CHIBA Jun’ichi, “‘Tycho Brahe’ in the Geology: The Compromise Models on the Plate Tectonics Revolution”;
MASHIMA Hidehisa, “Contributions of Tatsuro Matsumoto (1913-2009) to plate tectonics, a signifcant paradigm shift in earth science”;
YAMADA Kou, “Online Community Responses to Volcanic Disaster: A Study of Yahoo! News Comments on the 2018 Mt. Kusatsu-Shirane eruption”.

In 2019, the JAHIGEO issued its *Bulletin*, Numbers 52 and 53 (in Japanese), and the *JAHIGEO Newsletter*, Number 21 (in English). The content of *JAHIGEO Newsletter* is “A History of observations and investigations of volcanic eruptions and landslides on Izu-Oshima Island, near Tokyo, and a brief account of efforts by staff of the newly established Geopark to educate the public about their potential dangers” written by Michiko Yajima.

Fortunately, we once again had an opportunity to edit another special issue of the international journal of the HSSJ, *Historia Scientiarum*, *i.e.*: “The History of Geological Sciences in East Asia, Part II: Geoscience History in Transition” (vol. 28, no. 3, March 2019). The contents are as follows;
“Introduction” (by Toshihiro Yamada and Michiko Yajima),
“Geophysics in Japan in the Late 19th and Early 20th Centuries” (by Gregory A. Good),
“Edmund Naumann (1854-1927): *Fossa Magna* and Mt. Fuji” (by Michiko Yajima),
“Between the Field and the Classroom: The Using and Making of Geoscientific *Historia* in Meiji-Taisho Japan” (by Toshihiro Yamada),
“Earth Science before the Plate Tectonics Revolution in Japan: The Earth Sciences Department at Nagoya University 1942-1967” (by Shigeyuki Aoki), and
“Fusakichi Omori and Italy: Excerpts from the Visits of a Japanese Seismologist in the *Belpaese*” (by Gianluca Valensise).

Thus, together with the previous special issue (vol. 27, no. 3, March 2018; see last year record), we have 9 articles from China (1), Italy (2), United States (1), and Japan (5) on this theme. We are most grateful to INHIGEO members who supported our attempt, especially to Professor Gian Battista Vai for Italian contributions.

Tokyo Geographical Society has the Editorial Committee of History of Geosciences in Japan since 1992. The Committee intended to publish the History of Geosciences from 1868 to 1965. The members of Committee are late IMAI Isao, late ISHIYAMA Hiroshi, late FUJII Yoichiro, KURODA Kazuo, KATO Shigeo, KATO Shigeru, MATSUYAMA Hiroshi, SHIMAZU Toshiyuki, SUGAI toshihiko, TANIMOTO Tsutomu, YAJIMA Michiko, YAMADA Toshihiro, YAMAMOTO Akira, and YATSUMIMI Toshifumi. The committee already published three parts of “Introduction of Modern Geosciences into Japan, 1868 to 1891”; four parts of “Formation of Geosciences in Japan, 1892 to 1923”; five parts of “Development of Geosciences in Japan, 1924 to 1945”. In 2018, Committee published the Part 6 of “Trends of Geosciences after the Pacific War in Japan, 1945 to 1965” in *Chigaku Zasshi* (Journal of Geography), 127 (6), 835-860. The difficult enterprise is continuing.

Members’ activities including recent publications are as follows:
YOSHIDA Shigeo with his colleagues published a textbook of geoscience for university students, *Atarashii chikyu wakusei kagaku* [New Earth and Planetary Science], Baifukan, Tokyo, March 2019, 287 pp., which contains many historical notes.

KATO Shigeo, now in the United Kingdom, published “Science and the Japanese Empire during the AsiaPacific War,” *Rekishi hyoron* [Historical Journal], no. 832 (August 2019): 36-46. (in Japanese).

KATO Hirokazu began to publish his private journal for the research of Kenji Miyazawa titled *Chi to hito* [Land and Man], September 2019, 105 pp. The first issue focuses on the Buddhism concept *banpo ruten* [panta rhei; everything is constantly changing] viewed from historical geology and paleontology. He also published "MIYAZAWA Kenji and his literary works in Hokkaido and Karafuto (Sakhalin) viewed from cultural geology", *Chikyu Kagaku* [Earth Science], vol.73 (2019), 23-33 (in Japanese).

YAJIMA Michiko published *Chishitsu-gakusha Nauman den:* Fossa magna *ni idonda oyatoi gaikoku jin* [Biography of Edmund Naumann, geologist: A foreign employee who explored *Fossa magna*], Asahi Shimbun Publications, Tokyo, October 2019, 320+45 pp. In 1994, Yajima began to study on the life and work of Heinrich Edmund Naumann (1852-1927), German geologist, who established the geology of Japan in the Meiji Era. This is the complete results of her long work with many episodes and rich bibliography. After the publication, she gave Naumann lectures in Osaka and other places.
AIDA Nobuyuki received an interview as an expert of paleomagnetism from the Chunichi Shimbun Newspaper Publisher about the Chiba section for the new stage of 'Chibanian' in Ichihara, Chiba Prefecture, which was published in the newspaper *Tokyo Shimbun* of 20 October 2019, p. 25. Fortunately, 'Chibanian' as the age after Calabrian was accepted in the conference of IUGS in Busan, 17 January 2020.

YAMADA Toshihiro visited Beijing 29 October-3 November to communicate with Chinese INHIGEO members and to give the lecture of "How to describe the geo-history: 'Stenonian Revolution' to 'Anthropocene'" in English at the Institute for the History of Natural Sciences, CAS. He was invited by Professor Zhang Jiuchen.

It is very sad to add lastly the news that the excellent Honorary Member SUWA Kanenori passed away on 15 March 2020. He was 91. Please see the Obituaries section of this issue.

Hirokazu Kato and Michiko Yajima, Tokyo; Toshihiro Yamada, Tateyama, Chiba

LITHUANIA

In 2019, the Lithuanian INHIGEO group, led by Prof. Acad. **Algimantas Grigelis**, was extended and now contains five members. Three new members: **Prof. Valentinas Baltrūnas, Prof. Algimantas Česnulevičius** and **Dr. Eugenija Rudnickaitė**, approved by Bureau INHIGEO have been elected on Genaral Assembly meeting held in Varese, Italy, at 4th September, 2019.

Important personal news should be noted that on 6th July, 2019, Day of the State, Academician **Algimantas Grigelis** was awarded *The State Gediminas Order* for remarkable achiewements in science and culture development of the Republic of Lithuania.

The members of Lithuanian group took part with scientific reports on several national and international events during the reporting year:

1. 29th Conference on Baltic Science history in Vilnius, dedicated to the 440th anniversary of the Vilnius University.
2. Symposium devoted to 130th anniversary of the death of Ignacy Domeyko, the eminent mineralogist, held in Krakow, Poland;
3. The new Silurian Graptolith species *Gothograptus domeykoi*, indicating lundgreni zonal moment, was named by S. Radzevičius et al., 2019, in honour of Ignacy Domeiko, a the Man of the world [see: http://naujienos.vu.lt/vu-profesorius-aprase-nauja-graptolitu-rusi/; https://www.biotaxa.org/Zootaxa/article/view/zootaxa.4568.3.2].
4.. 44th INHIGEO Symposium "Communication in Geology" in Varese, Italy.
5. 130th anniversary of the birth of famous geologist Mykolas Kaveckis held in Vilnius and Kaunas Universities.
6. In addition, few exibitions and presentations on achievements in geology of Lithuania have been organised for public.
7. Special event organised by Dr. **Eugenija Rudnickaitė** and dedicated to the 440th anniversary of Vilnius University: EUROPEAN NIGHT OF MUSEUMS – 2019: "Witnesses to the Long History of the University at the Museum of Geology of Vilnius University" ["Ilgos universiteto istorijos liudininkai VU Geologijos muziejuje. Skiriama Vilniaus universiteto 440-ajam jubiliejui"]; http://www.geol.gf.vu.lt/lt/muziejus; https://www.muziejunaktis.lt/renginiai/jusu-laukia-vilniaus-universiteto-geologijos-muziejus;

https://openagenda.com/ndm-2019-europe/events/university-history-witnesses-at-museum-of-geology-of-vilnius-university-dedicated-to-the-440th-anniversary-of-vilnius-university?lang=en

Special Recognition
Book of Lithuanian children's map competition. The goal of the Lithuanian Cartographic Society, founded in 2003, is to promote the use of maps and to expand the range of topics covered. The Society has for the past fifteen years organized the national stages of the international children's map competition, which take place every two years.

At least 800 works from all over Lithuania are sent to the competitions every time, and in 2019, that number surpassed 1,200! Selected six of the best, most interesting maps of travel in the closing event of the international competition, with an increasingly different places in the world. And every time Lithuanian children receive prizes in international competitions, usually in the first places of the age in the group, and in 2019 we were surprised with the two highest ratings: with the first place in one age group and we also received a special prize for creativity. This book is as the result: http://kc.gf.vu.lt/wp-content/uploads/2019/12/VaikuLT_maketas1-196-web.pdf.

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The detailed topics are expressed in list of selected works of group members given below.

Selected works on history of geology of Lithuania, 2019:
1. Carol Eduard von Eichwald (1795–1876) : an Early Prie-Evolutionist at Vilnius University / Algimantas Grigelis, Birutė Railienė // *The 29th Baltic Conference on the History of Science : abstracts, 19–21 September, 2019, Vilnius, Lithuania* / Vilnius University ; editor of abstracts book Ramūnas Kondratas. – Vilnius, 2019. – P. 28–29. http://www.moksloistorija.lt/the-29th-baltic-conference-on-the-history-of-science-algimantas-grigelis-and-birute-railiene/

2. Algimantas Grigelis. Country reports for 2018 : Lithuania // *INHIGEO Annual Record*. – Johnstown, Pennsylvania, USA/51.

3. Algimantas Grigelis. Iškilusis mokslo minties versmių tyrėjas : prof. Juozo Algimanto Krikštopaičio (1931–2018) atminimui. – Nuotr. – Bibliogr.: 18 pavad. // *Mokslo Lietuva*. – Vilnius, 2019, kovo 16 (nr. 6), p. 9. [In memoriam of Prof. Juozas Algimantas Krikštopaitls[.

4. Algimantas Grigelis. Mineralo gijos pradininkas Lietuvos universitete : minint profesoriaus Mykolo Stasio Kaveckio 130-ąsias gimimo metines (1889-02-20/06-02–1968-02-28). – Iliustr., portr., nuotr. – Bibliogr.: 6 pavad. // *Mokslo Lietuva*. – Vilnius, 2019, geg. 10 (nr. 9), p. 6–7. [About Mykolas Stasys Kaveckis – pioneer of mineralogy in Lithuanian University].

5. Algimantas Grigelis. Pakerėtas vandenyno tolių : tolimojo plaukiojimo kapitonui Broniui Krikštopaičiui (1902-1999) atminti. – Iliustr., portr.–Bibliogr.: 2 pavad. // *Mokslo Lietuva*. – Vilnius, 2019, bal. 4 (nr. 7), p. 2, 8. [In memoriam of Captain Bronius Krikštopaitis].

6. Algimantas Grigelis. Pathway of the Baltica, from Yearbook to the International Journal on Geosciences. – Iliustr., faks., portr. – Santr. angl. – Bibliogr.: 31 pavad. // *Baltica*. – Vilnius, vol. 32, no 1 (2019), p. 1–9. http://www.gamtostyrimai.lt/uploads/documents/lediniai/Baltica/Vol-32-1-2019/01%20Baltica%202019%2032-1%20Grigelis.pdf

7. Prasmingas okeanologo ir jūrų geologo kelias : dr. Marijonas Repečka, 1937 01 09–2018 10 17 / Leonora Živilė Gelumbauskaitė, Algimantas Grigelis, Olegas Pustelnikovas. – Nuotr., portr. – Bibliogr.: 26 pavad. // *Geologijos akiračiai = Journal of the Geological Society of Lithuania*. – Vilnius, 2019, nr. 1/2, p. 60–66. http://www.lgeos.lt/geologijos-akiraciai/uncategorised/2019-m-1-2-nr. [In memoriam of oceanographer Marijonas Repečka].

8. The Prussian origin of Baltic amber: a history of discoveries / Algimantas Grigelis, Leonora Živilė Gelumbauskaitė // *44th Symposium International Commission on the History of Geological sciences : program and book of abstracts, Varese – Como, Italy, 2–12 September, 2019*. – Gallarate, 2019. – P. 80.

9. Algimantas Grigelis. Trys Ignoto Domeikos kelionės : (130-osioms mirties metinėms). – Iliustr., portr. – Bibliogr.: 26 pavad. // *Mokslo Lietuva*. – Vilnius, 2019, saus. 15 (nr. 1), p. 4–5; saus. 27 (nr. 2), p. 2, 4. [Three journeys of Ignacy Domeyko].

10. *Baltica*: an International Journal on Geosciences / Nature Research Centre. Institute of Geology and Geography; editor-in-chief Albertas Bitinas ; scientific programe committee Algimantas Česnulevičius, Leonora Živilė Gelumbauskaitė, Algimantas Grigelis ... [et al.]. – Vilnius, 2011–. – ISSN 0067-3064.

11. Abstracts of the 29th Baltic Conference on the History of Science : abstracts, 19–21 September, 2019, Vilnius, Lithuania / Vilnius University ; editor of abstracts book Ramūnas Kondratas ; program committee: Jūras Banys, Vincas Būda, Algimantas Grigelis ... [et al.]. – Vilnius : Vilnius University, 2019. – 91 p. – ISBN 978-609-07-0253-6. http://www.moksloistorija.lt/the-29th-baltic-conference-on-the-history-of-science-abstracts/

12. Algimantas Grigelis. First exile in Zapole // *International conference on Ignacy Domeyko, a world-famous geologist and mining engineer, on the 130th anniversary of his death, 14th June 2019*, AGH University of Science and Technology, Krakow. https://www.fundacja.agh.edu.pl/konferencja-domeyki

13. Algimantas Grigelis. Jurassic fossils in the geological history of the Andes // *International conference on Ignacy Domeyko, a world-famous geologist and mining engineer, on the 130th anniversary of his death, 14th June 2019*, AGH University of Science and Technology, Krakow (Poland). https://www.fundacja.agh.edu.pl/konferencja-domeyki

14. The Prussian origin of Baltic amber: a history of discoveries / Algimantas Grigelis, Leonora Živilė Gelumbauskaitė // *International commission on the History of Geological Sciences 44th INHIGEO symposium, 2–12 September 2019*, Varese ; Como (Italy). https://inhigeo2019.jimdofree.com/

15. Algimantas Grigelis. Paroda, skirta geologo, mineralogo, kalnų inžinieriaus Ignoto Domeikos (1802–1889) mirties 130-osioms metinėms paminėti : parodos "Pažvelk į mineralą dar bevardį" pristatymas, *2019 m. sausio 24 d., Lietuvos mokslų akademijos Vrublevskių biblioteka* http://alkas.lt/2019/01/23/vrublevskiu-bibliotekoje-bus-prisimintas-ignotas-domeika/ [Photo exibition to anniversary of Ignacy Domeyko].

16. Algimantas Grigelis. Posėdis, skirtas profesoriaus Mykolo Kaveckio 130-osioms gimimo metinėms: prisiminimų popietė, 2019 m. gegužės 20 d., Vilniaus universiteto Chemijos ir geomokslų fakulteto Geologijos ir mineralogijos katedra, Geologijos muziejus. [130 years memory of Mykolas Stasys Kaveckis].

17. Algimantas Grigelis. Fotografijų paroda: Tolimosios Aliaskos eskizai: per vienuolika laiko juostų: 2019 m. vasario 4 d., Gamtos tyrimų centras. [V.Pukelytė. Priklausomybė = Addiction. *Geologijos akiračiai = Journal of the Geological Society of Lithuania*. Lietuva, Vilnius, 2019, nr. 1-2, p. 44-48. http://www.lgeos.lt/geologijos-akiraciai/uncategorised/2019-m-1-2-nr. [Photo exibition of journey to Alaska].

18. Algimantas Grigelis – the "Theodor von Grotthuss" medal. – Iliustr. nuotr. – (Awards) // INHIGEO Annual Record. – Johnstown, Pennsylvania, USA, 2018, No. 51, p. 38. http://www.inhigeo.com/record/51.pdf.

19. Olechnovičienė, Jadvyga. Akademikui Algimantui Grigeliui – Lietuvos didžiojo kunigaikščio Gedimino ordinas. – Iliustr., faks. // *Geologijos akiračiai = Journal of the Geological Society of Lithuania*. Lietuva, Vilnius, 2019, nr. 3/4, p. 46–47. http://www.lgeos.lt/geologijos-akiraciai/uncategorised/2019-m-3-4-nr. [State Gediminas order award to Algimantas Grigelis].

20. Algimantas Česnulevičius. Lietuvos valstybingumo atspindžiai kartografiniuose kūriniuose. Konferencija, skirta lietuviškosios kartografijos šimtmečiui. 2019 birželio 6 d. Valstybės pažinimo centras. Vilniaus universiteto Chemijos ir geomokslų fakulteto Kartografijos ir geoinformatikos katedra. = *Reflections of Lithuanian statehood in cartographic works. Conference dedicated to the 100th anniversary of Lithuanian cartography. June 6, 2019 State Cognition Centre. Organizer: Department of Cartography and Geoinformatics, Faculty of Chemistry and Geosciences, Vilnius University.*

21. Paroda “Valstybingumo ir administracinio padalijimo atspindžiai senuosiuose žemėlapiuose”, skirta lietuviškosios kartografijos šimtmečiui. Vilnius, Valstybės pažinimo centras, 2019 birželio 6 – 13 d. d. Organizatoriai: Valstybės pažinimo centras ir Vilniaus universiteto Chemijos ir geomokslų fakulteto Kartografijos ir geoinformatikos katedra. = *Exhibition "Reflections of Lithuania Statehood and Administrative Division in Old Maps", dedicated to the 100th anniversary of Lithuanian cartography. Vilnius, State Cognition Centre, June 6 - 13, 2019. d. Organizers: State Cognitive Centre and Department of Cartography and Geoinformatics, Faculty of Chemistry and Geosciences, Vilnius University.*

22. Algimantas Česnulevičius. Lietuviškosios kartografijos pradininkas. Konferencija, skirta prof. Vaclovo Chomskio 110 gimimo metinėms. Vilnius. 2019 lapkričio 14 d. Vilniaus universiteto Chemijos ir geomokslų fakulteto Kartografijos ir geoinformatikos katedra. = *Pioneer of Lithuanian cartography. Conference for the 110th anniversary of the professor Vaclovas Chomskis birthday. Vilnius. November 14, 2019. Organizer: Department of Cartography and Geoinformatics, Faculty of Chemistry and Geosciences, Vilnius University.*

23. Paroda “Profesorius Vaclovas Chomskis: lietuviškosios kartografijos ištakos”, skirta prof. Vaclovo Chomskio 110 gimimo metinėms. Vilnius. Vilniaus universiteto Chemijos ir geomokslų fakulteto Geomokslų institutas. 2019 lapkričio 14 – 21 d.d. Organizatorius: Vilniaus universiteto Chemijos ir geomokslų fakulteto Kartografijos ir geoinformatikos katedra. = *Exhibition "Professor Vaclovas Chomskis: The Origins of Lithuanian Cartography", dedicated to the 110th anniversary of the professor Vaclovas Chomskis birthday. Vilnius. Institute of Geosciences, Faculty of Chemistry and Geosciences, Vilnius University. November 14 - 21, 2019. Organizer: Department of Cartography and Geoinformatics, Faculty of Chemistry and Geosciences, Vilnius University.*

24. Baltrūnas V., Malinauskas Z., Šliaupa A. 2019. Vadinome jį geonuotraukos “šefu” [We called him the head of geological mapping]. *Geologijos akiračiai = Journal of the Geological Society of Lithuania*, 2019, Nr. 1-2 (113-114), p. 55-59. http://www.lgeos.lt/geologijos-akiraciai/uncategorised/2019-m-3-4-nr.

25. Eugenija Rudnickaitė. 2019. Pranešimas “*Perpetuum mobile???* arba ką gali vienas žmogus?” *konferencijoje “Respublikinio V.Into akmenų muziejaus reikšmė Mosėdžio kultūriniame gyvenime”, 2019-05-17-18, Mosėdis*. – [= Oral presentation “*Perpetuum mobile ???* or what can one human to do?” at the conference “The Significance of the Republican V.Intas Stone Museum in the Cultural Life of Mosėdis”]

26. Eugenija Rudnickaitė. 2019. “The most prominent scientists who spread the geological knowledge at the very beginning of the history of Vilnius University”. *44th INHIGEO Symposium, 2 – 12 September 2019, Varese –Como, Italy*. - Oral presentation. https://inhigeo2019.jimdofree.com/

27. E. Rudnickaitė. 2019. Witnesses to University History: Collections at the Vilnius University Museum of Geology. *The 29th Baltic Conference on the History of Science, 19-21 September 2019, Vilnius, Lithuania. [Dedicated to Vilnius University 440th anniversary]*“. - Oral presentation. http://www.bahps.org/29-bchs

28. Rudnickaitė, Eugenija; Puišo, Judita. 2019. Paminėtos profesoriaus Mykolo Kaveckio 130-osios gimimo metinės = Remembering Mykolas Kaveckis on his 130th birth anniversary. *Geologijos akiračiai = Journal of the Geological Society of Lithuania*. Vilnius : Lietuvos geologų sąjunga. 2019, Nr. 3-4, p. 25-28. ISSN: 1392-0006 ; eISSN: 2424-3612. http://www.lgeos.lt/geologijos-akiraciai/uncategorised/2019-m-3-4-nr.

29. Rudnickaitė, Eugenija. 2019. Mykolas Kaveckis (1889 05 20 – 1968 02 28) = Mykolas Kaveckis. *Geologijos akiračiai = Journal of the Geological Society of Lithuania*. Vilnius : Lietuvos geologų sąjunga. 2019, Nr. 3-4, p. 29-30. ISSN: 1392-0006 ; eISSN: 2424-3612. http://www.lgeos.lt/geologijos-akiraciai/uncategorised/2019-m-3-4-nr.

30. Eugenija Rudnickaitė. 2019. Witnesses to University History: Collections at the Vilnius University Museum of Geology. *The 29th Baltic Conference on the History of Science : abstracts, 19–21 September, 2019, Vilnius, Lithuania* / Vilnius University ; editor of abstracts book Ramūnas Kondratas. *[Dedicated to Vilnius University 440th anniversary]*, – Vilnius, 2019. – p. 70-71. http://www.moksloistorija.lt/the-29th-baltic-conference-on-the-history-of-science-eugenija-rudnickaite/

31. Eugenija Rudnickaitė. 2019. The most prominent scientists who spread the geological knowledge at the very beginning of the history of Vilnius University. *44th INHIGEO Symposium, 2 – 12 September 2019, Varese –Como, Italy: INHIGEO 2019 Program and Book of Abstracts [eds.: Ezio Vaccari, Andrea Candela and Maria Faccioli]*, p. 70-71.

32. Short temporary exhibition for four weeks – "The fossil remains of a crocodile *Diplocynodon* cf. *styriacu*s Hofmann, 1887 (= *Diplocynodon ungeri* Prangner, 1845) that lived 15 million years ago were given free of charge by a private collector as a gift for the 440th anniversary of Vilnius University". 80 excursions were carried out with an average of 20 visitors, a total of ~ 1600 visitors. The excursion story integrates the popularization of geology and other natural sciences. [Organizer and guide – dr. Eugenija Rudnickaitė. In total, in 2019, she conducted about 330 excursions per year.] https://lnk.lt/video/zinios-15-milijonu-metu-senumo-krokodilo-fosilija/61752; http://naujienos.vu.lt/vilniaus-universiteto-geologijos-muziejuje-15-milijonu-metu-senumo-krokodilo-fosilija/; https://www.facebook.com/VUGMK; etc.

33. Mokytojų kvalifikacijos tobulinimo seminaras "Geologija ir gamtamokslinis ugdymas" mokytojams ir jaunųjų geologų būrelių vadovams. Organizatorius: VU Geologijos ir mineralogijos katedra [E.Rudnickaitė] = *Teacher training seminar "Geology and science education" for teachers and leaders of school children young geologists' groups. Organizer: VU Department of Geology and Mineralogy [E.Rudnickaitė]* https://www.vu.lt/kviecia-vu/renginiai-mokytojams#mokytojams-geografams-fizikams-chemikams-biologams-kvalifikacijos-tobulinimo-seminara-geologija-ir-gamtamokslinis-ugdymas; https://www.facebook.com/VUGMK/posts/vu-chgf-geologijos-ir-mineralogijos-katedroje-vasario-21-22-dienomis-vyko-mokyto/415206139232876/; https://www.chgf.vu.lt/apie-fakulteta/naujienos/1569-geologijos-ir-mineralogijos-bei-hidrogeologijos-ir-inzinerines-geologijos-katedrose-mokytoju-susiburimas; etc.

34. Ekspedicija į Žemaitkiemį dar nesurastų Žemaitkiemio meteorito egzempliorių paieškai, skirta pirmojo Lietuvos meteoritų tyrėjo prof. Mykolo Kaveckio 130 gimimo metinėms paminėti [Ekspedicijos konsultantė ir dalyvė – E.Rudnickaitė] = *Expedition to Žemaitkiemis in search of specimens of Žemaitkiemis meteorite not yet found, dedicated to the first Lithuanian meteorites researcher prof. Mykolas Kaveckis to commemorate the 130th anniversary of his birth. [Expedition consultant and participant – E.Rudnickaitė]* https://www.15min.lt/mokslasit/straipsnis/kosmosas/tarptautine-mokslininku-grupe-zemaitkiemyje-ieskos-meteorito-pedsaku-651-1134358; https://www.15min.lt/mokslasit/straipsnis/kosmosas/po-beveik-90-metu-tarptautine-ekspedicija-ieskojo-zemaitkiemio-meteorito-kaip-sekesi-651-1136720; https://www.ukzinios.lt/gyvenimas/aktualijos/20528-zemaitkiemyje-ieskojo-meteorito-skeveldru; http://www.gzeme.lt/2019/04/28/po-85-metu-i-zemaitkiemi-grizo-meteoritu-ieskotojai/, etc.

Algimantas Grigelis

MEXICO

Scientific Conferences

AZUELA, Luz Fernanda, "The cultivation of the tree of natural sciences in the public sphere of the 19th century in Mexico: The Mexican Society of Natural History (1868-1914)", Cycle of Conferences *Scientific Groupings of Mexico City, 19th and 20th centuries*, Interdisciplinary Association for the Study of the History of Mexico - Ministry of Finance and Public Credit, March 12th, 2019.

AZUELA, Luz Fernanda, "Mexican Science at the Crossroads of French Imperialism and Maximilian's Empire (1864-1867)", Cabinet of Natural History Seminar, Department of History and Philosophy of Science, Cambridge University, May 13th, 2019.

AZUELA, Luz Fernanda, "Geological Research in Nineteenth Century Mexico: Co-production and Globalization", 44th Conference of the International Commission on the History of Geological Sciences (INHIGEO), Varese and Como, Italy, September 2-12th, 2019.

MORELOS, Lucero, "The Allende Meteorite Fall and historic context*", Memories of Our Solar System: 50 years of the Allende Meteorite Fall*, Nuclear Sciences Institute (ICN) at the National Autonomus University of Mexico (UNAM), February 2019.

MORELOS, Lucero, "Women in the Earth Sciences", *National Congress on Geology*, Mexico City, April 2019.

MORELOS, Lucero, "The creation of the Institute of Geology at the National Autonomus University of Mexico UNAM", *9th International Congress of Historians*, April 2019.

MORELOS, Lucero, "The role of the Institute of Geology in the energetic development in Mexico", *7th Encounter with Earth*, Mexico City, April 2019.

MORELOS, Lucero, "The rise of the geological sciences in Mexico", *3rd Symposium on Earth Sciences "Four Sciences, One Earth"*, Mexico City, May 2019.

MORELOS, Lucero, "Andres Manuel del Rio and the discovery of the element vanadium", in: *The elements in Earth Sciences: From the Cosmos to Our Planet",* June 2019.

MORELOS, Lucero & Jesús ACEVES, "Ephemeris of Institute of Geology", in *Social Media Facebook Instituto de Geología UNAM*, June 2019.

MORELOS, Lucero, "Dolores Rubio Ávila. A First Engineer´s Scholar and Academic in Mexico, 1910", during the *International Commission on the History of Geological Sciences 44th Conference*, Held in Italy, September 2019.

MORELOS, Lucero, "Mariano Bárcena and the first days of the Meteorological Observatory of Mexico (1877-1899)", *Institucional Seminary of Centre for Atmospheric Science at the National Autonomus University of Mexico (UNAM),* September 2019.

GARCÍA-VALLES, Maite, Miguel Ángel CRUZ, Alejandro PASTRANA, Lucero MORELOS & Carles CANET, "Golden and Green Obsidian of Cerro de las Navajas, Comarca Minera, Hidalgo UNESCO Global Geopark: a precious millenary volcanic glass, *XVIII International Congress of Geological and Mining Heritage,* Spain, September 2019.

MORELOS, Lucero, "The creation of the Institute of Geology in Mexico, 1929", Institucional Seminary, November 2019.

MORELOS, Lucero, "Humboldt and other travelers in Mexico", Palace of Mining, Mexico City, November 2019.

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Recent Bibliography

Books

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AZUELA, Luz Fernanda & Rodrigo VEGA (COORDS.), *Las investigaciones geográficas, naturalistas y geológicas en México, 1876-1946,* [*Geographical, naturalistic and geological research in Mexico, 1876-1946],* Instituto de Geografía, UNAM. (In press)

GOVANTES, Ricardo & Lucero MORELOS (COORDS.), *Historias de científicos. Antología de la memoria disciplinaria y reflexiones historiográficas,* [*Scientists' stories. Anthology on disciplinary memory and historiographic reflections],* Mexico, Bonilla Artigas Editores, UNAM. (In press).

SARMIENTO, Marcos, Mari Carmen NARANAJO, María José BETANCOR & José Alfredo URIBE (EDS.), *Reflections on Darwinism from the Canary Islands*, Madrid, Ediciones Doce Calles, University de Las Palmas de Gran Canaria, National Autonomous University of Mexico, Michoacana University of San Nicolás de Hidalgo, 2019 590 pp. (ISBN: 987-84-9744-267-1).

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AZUELA, Luz Fernanda, "La Naturaleza. Periódico de la Sociedad Mexicana de Historia Natural: Prácticas locales en el entorno de la expansión global" ["La Naturaleza. Mexican Society of Natural History Newspaper: Local Practices in the Global Expansion Environment"], in Rodrigo VEGA (COORD.), *Historia de las relaciones entre la prensa y las ciencias naturales, médicas y geográficas de México (1836-1940)*, Facultad de Filosofía y Letras, UNAM. (In press)

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MORELOS, Lucero, "La estatuaria en la geología mexicana del siglo XX", ["The Statuary in 20th-century Mexican geology"], in Rafael GUEVRA & Miguel GARCÍA (COORDS.), *Memoria y disciplina: Aproximaciones a la historia de la ciencia,* [*Memory and discipline: Approaches to the history of science],* Faculty of Philosophy and Letters, UNAM. (In press).

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URIBE, José Alfredo & María Teresa CORTÉS, "Technical-scientific knowledge against the depreciation of silver in Mexico: 1870s", in *Ciencia Nicolaita.* Scientific Journal of the Michoacana University of San Nicolás de Hidalgo, no. 76, September 2019, pp. 23-45. (ISSN: 2007-7068). Available in: www.cic.cn.umich.mx/cn/article/view/429/362

URIBE, José Alfredo, "El Instituto Geológico de México y sus relaciones con la indutria minera: el caso de la empresa minera "Dos Estrellas", en El Oro y Tlalpujahua", ["The Geological Institute of Mexico and its relationship with the mining industry: the case of the "Las Dos Estrellas" Mining Company, in El Oro and Tlalpujahua, S. A"], in AZUELA, Luz Fernanda & Rodrigo VEGA (COORDS.), *Las investigaciones geográficas, naturalistas y geológicas en México, 1876-1946*, Instituto de Geografía, UNAM. (In press).

Book Reviews

URIBE, José Alfredo, Review of MENDOZA, V. Vandari, *The Mexican Invention Patents. Institutions, actors and artifacts (1821-1911),* El Colegio de Michoacán, 2018, 634 pp., in *Saberes. Revista de Historia de la Ciencia y las Humanidades,* [*Knowledge. Journal of the History of Science and Humanities],* 2, 6, 2019, pp. 146-150. Available in: www.saberesrevista.org/ojs/index.php/saberes/article/view/160/91

As a final note, we would like to add that members of our group continue teaching three different courses in the National Autonomous University (UNAM), University of the Basque Country and Universidad Michoacana de San Nicolás de Hildago (UMSNH), containing topics on the History of Geological Sciences, that contribute to raising the interest of young students in our subject matter.

Lucero Morelos, luceromr@geologia.unam.mx

New Zealand

INHIGEO activities in New Zealand continues as in previous years. 2019 saw the publication by the Geoscience Society of New Zealand of **Simon Nathan**'s book *Flying High – the Photography of Lloyd Homer* (see review in this Annual Record). The book was widely launched, firstly in Lower Hutt and Wellington followed by Simon giving talks to a variety of organisations in many parts of New Zealand. Simon also presented a paper on New Zealand geological photographers, primarily pioneering geologist Alexander Mackay and Lloyd at the INHIGEO meeting in northern Italy (see report of the meeting in this Record). **Mike Johnston** was the only other INHIGEO member from New Zealand to participate in the meeting and he presented a paper on understanding the Late Paleozoic-Early Triassic Maitai Group in this country. The first volume of Mike's history of the Nelson goldfields has been submitted for publication, which is scheduled for 2020.

Rodney Grapes continues as editor of the *Journal of the Historical Studies Group*, of the Geoscience Society of New Zealand. Three issues were again published during the year and contained 16 articles:

Number 61 February 2019
F. W. Hutton and his little book – Glenn Vallender
Pyroclastic flow deposits, Hinuera Valleu, central North Island, and note on the usage of ignimbrite as a building material – David Lowe and Adrian Pittari
Snake stones and devil's toenails – Graeme Stevens
A geological gallery from the 1950s – Simon Nathan
Observations on the culture of the New Zealand Geological Survey 1950s-1970s – Graeme Stevens
George Grindley (1925-2019) – Contributed by Simon Nathan

Number 62 May 2019
Harold Wellman – managing the maverick side of his character – Graeme Stevens
Anecdotes from early years with the New Zealand Geological Survey in Greymouth, 1962 - 1966 – Don Young
Another side to Malcolm Laird, geologist and pioneer caver – Mary Trayes
Geological work in New Zealand, 1974-2000 – Gerrit Neef
Mrs Bell in the field – Simon Nathan

Number 63 October 2019
Comment on the article "Harold Wellman – managing the maverick side of his character" by Graeme Stevens – Tom Haskell
First pottery made in New Zealand – Rodney Grapes
Possibly unreliable reminiscences of Harold Wellman – Nick Perrin
The early days of New Zealand marine geology Part 6: Learning at Vic from men who moved seabeds – Keith Lewis
Mr Crawford's 'granite' from Upper Hutt – Rodney Grapes

John Taylor is researching the history of the Globe-Progress gold mine in Reefton and was also one of the "lead actors" in a video documentary being produced on the history of the nearby Blackwater Mine and the mining township of Waiuta. He has also been contracted to scan all the historic diaries and sketches of Charles (Charlie) Edward Douglas (1840-1916), the only New Zealand resident to have been employed as an "explorer." Douglas knew the wet, inhospitable mountains of South Westland better than anyone.

Mike Johnston, Nelson

Poland

In 2019, the 100th anniversary of the establishment of the Polish Geological Institute (PGI) was celebrated, which, being a scientific institute from the very beginning, also fulfilled the role of a geological survey. PGI was established only a few months after Poland regained independence (November 11, 2018). A group of deputies of the Legislative Parliament (Sejm) on April 3, 1919 brought the so-called an *urgent request*, and on May 7 that year the Institute was officially opened. Despite very great financial difficulties, PIG's activity was to be financed from the budget of the reborn State. Such a necessity was pointed out by the Minister of Industry and Trade, Prof. Wiesław Chrzanowski in a letter addressed to Prime Minister Wincenty Witos, and justified it with the fact that: *It is natural that no other institution or private organization within the state can do this task ... ... For the state's economic policy, it is important to have data on disposable resources, e.g. coal or kerosene, more*

reliable and detailed than the information that often in intentional pessimistic or intentionally optimistic form circulates among private entrepreneurs and swindlers. Real information, based on a strictly scientific analysis of a given practical issue, can only be obtained from our own body, the State Geological Office…

After 100 years of activity, PGI has fulfilled its obligations very well. Numerous successes in the field of geological cartography, regional geology, discoveries of mineral resources, hydrogeology, engineering geology, geochemistry, including environmental geochemistry were the subject of information articles published throughout the year in the monthly *Przegląd Geologiczny* (*Geological Review*), published by PGI. Retrospective articles filled the entire issue 7 of this magazine. The culmination of the jubilee year was the scientific conference: 100 years of the Polish Geological Institute - Experience and Future, which was organized by the Polish Commission on the History of Geological Sciences of the Polish Geological Society (PCHGS PGS) on November 19, 2019. A large audience (Fig. 1) could hear a dozen speeches, in which, based on the institute's previous achievements, the young generation of geologists from PGI presented the directions of development of geological works and the challenges facing Polish geology. This mixture of experience and youth gave a very good effect, which will materialize in the form of a large publication in 2020.

Figure 1. Audience at the conference celebrating the 100th Anniversary of the Polish Geological Institute.

The activity of the PCHGS PGS was supplemented by a special meeting devoted to the underground activity of the PGI Temporary Commission of Solidarity Trade Union during martial law in Poland in the years 1981-1989. It was a strange time, when in a country in the center of Europe a large part of the society was conducting underground activity against state authorities. To provide as much reliable information about this period as possible, Grażyna Niemczynow-Burchart and Ryszard Wagner prepared a two-volume work entitled *Memoirs of Conspirators 1980-1989*. In addition to the memories of the participants of this activity, many documents and photographs from this period were collected, which over time are dispersed and forgotten.

The year 2019 was, also, the 130th anniversary of the death of the great geologist - Ignacy Domeyko (Fig. 2). He was involved with four modern States: Belarus, Lithuania, Poland, and Chile. On this occasion, on June 14, an *International Conference on Ignacy Domeyko, a World- Famous Geologist and Mining Engineer, on the 130th Anniversary of His Death* was organized in Krakow. The conference was attended by historians of science from all countries with which he was associated.

Figure 2. Ignacy Domeyko (1802-1889).

Ignacy Domeyko (1802-1889) was a Polish – speaking Lithuanian nobleman. During his childhood he was living in Nowogródek (presently at the Belorussian territory). As a 14-year-old adolescent, he entered Vilnius University, Physics and Mathematics Section in September 1816. At the end of 18th century and the start of 19th century, Vilnius University was famous in Europe, with nature sciences flourishing there. Domeyko finished his studies in the first half of 1820, but he didn't stop learning and attending different lectures, among them astronomy and mineralogy. In June 1822, just before his 20th birthday, he was granted the degree of the Master of Philosophy. In 1830, without hesitation, he joined insurrection against Russia called the "November Uprising." After defeat in the battle near Szawle

(presently in Lithuania), he retreated to Prussia, where he was interned. After that Domeyko visited some German towns including Mining Academy in Freiburg. Finally, he moved to Paris where he could continue his studies. Recommended by eminent geologist Elie de Beaumont, in August 1834 Domeyko became student at the Paris School of Mines. After three years of serious studies in August 1837 he graduated with a mining engineer diploma. In February 1838, he decided to go to Chile[21]. There, his activities started in La Serena School of Mines (Coquimbo Province) as an invited lecturer. But he didn't limit himself by teacher's duties only. He organized many expeditions on his own initiative. The results of these trips were really impressive: numerous finds of minerals, rocks, and fossils; and descriptions of new geological objects and phenomena. He discovered deposits of silver in Arqueros, gold in Cauquenes, copper in Cordillera de la Campana and hard coal in Valdivia. Domeyko revealed also numerous mineral springs and drew attention to the potential of nitrate at the Atacama Desert. In the years 1846 – 1884, he was employed as Professor and Rector of the Santiago – Chilean University. Then he became an organizer and leader of teaching, and he tried to get science and education involved in public activities. When he was 80 years old, he still continued his scientific research, mainly in mineralogy. *Domeykite* one of the minerals described by famous Austrian mineralogist Wilhelm von Haidinger was named after him. In the years 1884 – 1888 Domeyko took "romantic" trip to Europe visiting Paris, Rome, Holy Land, Warsaw and Cracow. In Cracow he delivered a report about the physical geographical methods applied for studying Poland. In April 1887 of 1887 Jagiellonian University in Cracow granted him a title of Honorary Doctor of Medicine. Domeyko gave several collections of minerals and rocks to this University, among them Chilean meteorite Vaca Muerta. In mid - 1888 he decided to go back to Chile. Unfortunately, during voyage the great geologist fell ill and died in Santiago on 23rd January, where he was buried. Domeyko is an unusual figure of the world format, worthy of attention and memory.

It is worth noting the extraordinary activity of Professor Zbigniew Wójcik, who in 2018 published an extensive biography of the oil industry pioneer Ignacy Łukasiewicz (1822-1882), and in 2019 he published another biography, this time about of an outstanding Polish geologist - Walery Goetel (1889-1972). In a certain sense, it is a supplement to the first book about this researcher. The first, published in 2009, concerned primarily the scientific, didactic, and organizational activity of W. Goetel. The new one mainly describes the activities of W. Goetel in the field of nature protection and its resources. Being a man fascinated by mountains, first of all the Tatras, he contributed to the creation of national parks on the Polish-Slovak border. He was one of the precursors of a very broad approach to environmental issues, which in his view should include all elements of the environment, both biotic and abiotic.

The Geological Review also published three articles by Jerzy B. Miecznik, an active member of the Section of the History of Geological Sciences of the Polish Geological Society, presenting biographies of outstanding Polish geologists: Jan Nowak (1880-1940), Stanisław Krajewski (1890-1968) and Jan Kutek (1935-2013).

Stanisław Wołkowicz

PORTUGAL

Ana Carneiro:

1. Ana Carneiro, Paula Urze, 'Joaquim Nery Delgado (19835–1908): The Diplomatic Dimension of a Geologist's Career,' *Diplomacy & Statecraft* 30:4 (2019), 1-22.
2. Teresa Salomé Mota, Ana Carneiro, Vanda Leitão, 'O Espaço dos Serviços Geológicos: um projecto de domínio territorial,' *in* Tiago Saraiva e Marta Macedo, orgs., Capital Científica. Práticas da Ciência em Lisboa e a História Contemporânea de Portugal, Lisboa, Instituto de Ciências Sociais /Imprensa de Ciências Sociais, 2019, pp. 111–138.

RUSSIA

Russian INHIGEO members, Zoya Bessudnova, Leonid Kolbantsev & Ivan Vtorov, visited the 44th Symposium INHIGEO in Italy. They enjoyed the wonderful hospitality and organization of the meetings in Varese and Como and made presentations on the topics:

[21] See: Grigelis, A., 2018, Chile, a second home of Ignacy Domeyko. An epilog: *INHIGEO Record No. 50*, p. 78-82.

Bessudnova Z. A. & Lyubina G. I. Paleontologist Maria Pavlowa's communication with foreign scientists in the late 19th – early 20th century.
Kolbantsev L. R. History of the Geological Mapping in Russia: from the first sketches to the State Geological Map.
Vtorov I. P. The importance of A. E. Fersman's research on Elba Island (1908).

Participants of the 44th Symposium INHIGEO in Italy. University of Insubria, Como, September 6, 2019.

On November 20, 2019, INHIGEO members from Russia and geologists interested in the history of geosciences met in the Geological Institute of the Russian Academy of Sciences in Moscow. Nine participants from three geological institutions attended the meeting, others were able to see it on video. We intend to continue monthly activities as Geology Section lectures and discussion at the Central House of Scientists RAS, and seasonally at the Geological Institute. Russia has 14 INHIGEO members from Moscow, Saint Petersburg and Cheboksary cities, and 11 of them have supported such activities. The Russian Geological Society also established the History of Geology Section, led by two INHIGEO members. So, we believe that the Russian group of INHIGEO members and historians may be included on the list of the INHIGEO Affiliated Association for Russia as *Russian National Commission of INHIGEO* (INHIGEO-RU).

All-Russian Geological Research Institute (VSEGEI, Saint Petersburg):
It is sad to announce the passing of Russian INHIGEO member **Dr. Andrey V. Lapo** who died in Saint Petersburg at the age of 81 (see the obituary section). He worked at the VSEGEI, was the Honorary Member of the Paleontological Society at the Russian Academy of Sciences, and member of the European Association for the Conservation of the Geological Heritage (ProGEO) (see Obituaries in this issue).

In 2019, **Leonid R. Kolbantsev** prepared information about the IGC sessions held in Saint Petersburg (1897) & Moscow (1984) to promote Saint Petersburg as the host for the 38th Session in 2028 (see a book review section).

Leonid Kolbantsev attended the next meetings with oral presentations:
Solemn meeting of the Scientific Council of the VSEGEI dedicated to the 75th anniversary of the final elimination of the Siege of Leningrad (St. Petersburg, January): *All-Union Geological Research Institute during the Siege of Leningrad (1941-1944).*
Scientific Conference "Mineralogical museums 2019. Mineralogy yesterday, today, tomorrow" (St. Petersburg, September): *History of the Semiprecious Map "Industry of the Socialism".*
The 10th International Symposium in Bulgaria "Mineral Diversity – Research and Preservation" (Sofia, October, co-authors O. V. Petrov & A. R. Sokolov): *The Mosaic Map "Industry of Socialism" as historic document and a mineral collection*.
The 40th International Annual Scientific Conference of the St. Petersburg Branch of the Russian National Committee on the History and Philosophy of Science and Technology RAS (October 29): Science and Technology, Questions of History and Theory: *All-Union Geological Research Institute (VSEGEI) during the Siege of Leningrad (1941-1944).*

Leonid Kolbantsev (left) at the 40th International Annual Conference "Science and Technology, Questions of History and Theory" in Saint Petersburg Mining University, October 29, 2019. Photograph: Ivan Vtorov.

N. M. Fedorovsky All-Russian Institute of Mineral Resources (VIMS, Moscow):

Igor G. Pechenkin continued his presidency of the Geological Section at the Central House of Scientists, RAS, with monthly presentations on the history of geosciences. He also organized the next meetings in Moscow:

The 34th conference dedicated to a Russian mineralogist Anatoly (Nathan) I. Ginzburg (1917-1984) (March 6).

The 8th Scientific and Practical Conference of Young Scientists and Specialists dedicated to the 140th anniversary of the birthday of a Russian petrologist Vladimir V. Arshinov (May 14-15).

Commemorative lectures honoring the 100th anniversary of a geochemist and mineralogist, Professor Stepan T. Badalov (September 27).

The Evening dedicated to V. V. Arshinov in Museum of Entrepreneurs, Patrons and Philanthropist (November 26).

Igor Pechenkin presented the next papers:

The 25th Annual Conference of the S. I. Vavilov Institute of the History of Science and Technology, RAS (Moscow, March 28): *Kulikolon – a unique deposit of optical fluorite: history of discovery and development*.

The 14th International Scientific and Practical Conference "New Ideas in Earth Sciences" (Moscow, April 2-5): *Asphalts of North-West China: discovery, study, development*.

The conference "Mineralogical museums – 2019. Mineralogy yesterday, today, tomorrow" (St. Petersburg, September 7-19): *The history of the creation of domestic synthetic rubies and sapphires*.

The scientific and technical conference "Geotechnological methods for uranium extraction" dedicated to the 50th anniversary of the application of the geotechnological method of uranium extraction in Bulgaria (Sofia, October 17-18): *Features of prospecting for uranium deposits in oil and gas basins: historical review.*

The 13th scientific and practical conference "History of science and technology. Museum business". (Moscow, December 5): *Change of concept about mineral resources in the 20th and early 21st centuries*

Igor G. Pechenkin (second left) in the Central House of Scientists RAS with students and professors of the Russian State University for Geological Prospecting. Moscow, November 28, 2019.

In the Museum of Russian Entrepreneurs, Patrons and Philanthropists. November 26, 2019.

Geological Institute, Russian Academy of Sciences (GIN RAS, Moscow):

Natalia I. Bryanchaninova, Irena G. Malakhova & **Ivan P. Vtorov** (Department for the History of Geology) participated in scientific conferences, published books and papers. They reported on the activity of the Russian INHIGEO members at the INHIGEO-RU website and published some news on the web-page of the Geological Institute and on Wiki-news (in Russian).

In November 15, Information System "History of Geology and Mining" has been officially registered by the "Rospatent Agency." The system contains online data base about almost thousand geoscientists. It has become a popular source of information with 50,000 visitors in 2019, mostly from Russia (95%). Wikipedia editors made almost 500 links to it. So, in December 19, we led the Wiki-tour for them and provide sources for writing and improving articles about history of geosciences. We also help to develop online project "History of Russia in Photographs (1840-1990)" where we publish photos from our collection with art and historical values.

We provided original museum exhibits, documents, and reviews about academicians V. A. Obruchev, A. E. Fersman, W. M. Akhmedsafin and some other geologists which have been working during the World War II in the Urals, Siberia and Kazakhstan. The information and exhibits will be a part of the permanent exhibition about the contribution of geologists to the Victory in the new museum complex (the Battle of Prokhorovka Field Memorial) in Belgorod region.

Natalia Bryanchaninova participated and made oral presentations at:

The 17th Geological Congress of the Komi Republic (Syktyvkar, April 16-18): *The 100th Anniversary of Mark Fishman*.

The 40th International annual Scientific Conference of the St. Petersburg branch of the Russian National Committee on the History and Philosophy of Science and Technology of the RAS "Science and Technology, Questions of History and Theory": *Scientific schools of the Institute of Geology of Komi Scientific Center, Ural Branch, Russian Academy of Sciences* (St. Petersburg, October 29).

The International conference on the 75th Anniversary of the Komi Scientific Center On the collaboration of the Geological Institute of RAS and the Institute of Geology of the Komi Scientific Center, Ural Branch of RAS (1940-1990) (Syktyvkar, November 18-19): *Science in the regional space of modern Russia and abroad*.

The Chernov's readings Annual workshop (Syktyvkar, December 11): *Personal pensioner of Komi Republic: a dedication to 100th Anniversary of Nina N. Kuzkokova*.

Earth Sciences History Section. Ivan Vtorov (right) made a presentation at the scientific symposium "Earth Sciences: History, Current Problems and Prospects". Moscow, March 28, 2019. Photograph: Grigory Ilyin.

Ivan Vtorov participated and made the next oral presentations:

The Commission on the History, Philosophy and Sociology of Soil Science of the V. V. Dokuchaev Soil Scientists Society, in the V. V. Dokuchaev Soil Science Institute (Moscow, February 5): *Information System; "History of Geology and Mining:" history, structure, content, soil information.*

The 25th Annual Conference of the S. I. Vavilov Institute of the History of Science and Technology, RAS (Moscow, March 28): *The Information System "History of Geology and Mining" as a scientific tool for historians of Earth sciences*.

The 40th International Annual Scientific Conference of the St. Petersburg branch of the Russian National Committee on the History and Philosophy of Science and Technology of the Russian Academy of Sciences "Science and Technology, Questions of History and Theory" (St. Petersburg. October 29): *90th Anniversary of the Bulletin of the Commission for Study of the Quaternary*.

At the Geological Section, the Central House of Scientists RAS (Moscow, December 4), he reported about the Italian INHIGEO meeting and talked about *A. E. Fersman's research on Elba Island (1908).*

Saint Petersburg Mining University (St. Petersburg):

Yury L. Voytekhovsky continues his activity as the head of the History Commission of the Russian Mineralogical Society in Saint Petersburg. He led and conducted the Russian-German scientific expedition, organized in honor of the 250th anniversary of A. von Humboldt and the 190th anniversary of his travel in Russia (May-June 2019). He was compiler and editor of the 5th collection of articles on the history of geological knowledge: *Russian Mineralogical Society through the eyes of contemporaries*. (See Book Reviews).

Yuri Voytekhovsky & Natalia Bryanchaninova at the Mining University, St. Petersburg. Photograph: Ivan Vtorov

He participated with oral presentations at the next meetings:

The International 25th Annual Scientific Conference of the S. I. Vavilov Institute of the History of Science and Technology, RAS (Saint-Petersburg, March 28): *"Excerpts from the scientific memoirs" and other manuscripts of P. N. Chirvinskiy from the personal archive of D.P. Grigoriev*.

The 16th All-Russian scientific school "Mathematical research in natural sciences" (Apatity, October 22): *Scientific school on crystal morphology of Saint-Petersburg Mining University*.

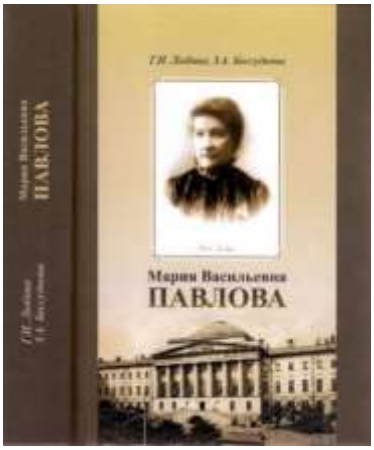
The 40th International annual Scientific Conference of the St. Petersburg branch of the Russian National Committee on the History and Philosophy of Science and Technology of the Russian Academy of Sciences "Science and Technology, Questions of History and Theory" (St. Petersburg. October 29): *250th anniversary of A. von Humboldt and the 190th anniversary of his travel in Russia*.

V. I. Vernadsky State Geological Museum, Russian Academy of Sciences (Moscow):

Zoya A. Bessudnova participated in the preparation of the exhibition "Masterpieces of the Geological Museum" to the 260th anniversary of the Vernadsky State Geological Museum.

The collective work "The Guide to the halls of the Vernadsky State Geological Museum of the Russian Academy of Sciences" in which Zoya Bessudnova has participated as a co-author and a co-editor was translated and published in English.

Zoya Bessudnova (with co-author Galina Lyubina) completed many years of her work with the scientific biography of Maria Vasilyevna Pavlowa (1854-1938).



Cover of: Maria Vasilyevna Pavlowa, *by G. I. Lyubina and Z. A. Bessudnova.*

She was among editors of the *Mineralogical Almanac* as in previous years.

In October 2019, Zoya Bessudnova was awarded the *Aleksander Fersman Medal for Merits in Geology* – see the Awards Section for details.

Tatyana Yu. Feklova from St. Petersburg branch of the S. I. Vavilov Institute for the History of Science and Technology, Russian Academy of Sciences made presentation at a conference at the Chinese Geological University (Wuhan).

PUBLICATIONS

Books:

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SERBIA

The past 2019 was the second year of the new/old term of the Division's Management (2018-2020): President - **Ljupko Rundić**, Secretary - **Tivadar Gaudenyi**.

The History of Geology Division of the Serbian Geological Society (SGS) has been an associate member of the International Commission on the History of Geological Science (INHIGEO) since 2015. The Division currently brings together 5 active researchers, geologists and geographers from the Faculty of Mining and Geology in Belgrade, Serbian Academy of Science and Arts (SASA), the Geographical Institute of SASA and the Faculty of Science in Novi Sad who are also active members of the International Commission on the History of Geological Science (INHIGEO).

We are pleased to say that our oldest member, **Prof. Aleksandar Grubić**, an Honorary Member of the International Commission on the History of Geological Science (INHIGEO) since 2015, has been very active in the last year. Unfortunately,

our colleague and active member of the Section, former SGS President, **Prof. Nenad Banjac** (born on 1952), passed away in Belgrade on April 23, 2019, after a serious illness (see the Obituaries section of this issue).

During 2019, members of the Geology History Division had quite a variety of activity. Vidojko Jovic worked on the preparation for printing of a special Proceedings in the edition of the Serbian Academy of Sciences and Arts, which was dedicated to marking 150 years since the birth of Prof. Vladimir Laskarev. In it, numerous authors have written about the life and contribution of Professor Vladimir Dimitrievich Laskarev to the geological profession and science. Since 2019 was a year of remembrance of the significant birthdays of the greats of our geology, Prof. Ljupko Rundić collected materials and archival documents on the Academician Ljubomir Klerić (1844-1910) and seismologist Jelenko Mihailović (1869-1956). Simultaneously, academiacian Vidojko Jović and Prof. Dragutin Jevremović prepared documents on mineralogist Svetolik Stevanović (1869-1953) and Academician Milan Luković (1889-1972). Work on a monograph on Lj. Klerić, which will contain a lot of new data from the life and work of the pioneers of Serbian geology and mining in the second half of the nineteen century, continues into 2020.

The Secretary of our Division, T. Gaudenyi, in cooperation with the Ministry of Telecommunications and the Post of Serbia, has carried out the activity of issuing anniversary post stamps with the image of Svetolik Stevanović (1869-1953) and Jelenko Mihailović (1869-1956), on the occasion of 150 years of their birth (see that stamps below). Similar post stamp with the image of Academician Lj. Klerić will be issued during 2020. To remind, our Division initiated the printing of a similar anniversary post stamp for Vladimir Laskarev (2018) as well as for several other prominent geologists during the earlier years (Anton Koh, Jovan Žujović, Petar Stevanović, etc.). In addition, colleague Dr. Dejan Radivojević gave a lecture on William Smith, the father of modern stratigraphy on occassion of 250th anniversary of his birth.

Particularly nice event over the past year was the official opening of the memorial house to our distinguished geologist, the late academician Petar Stevanović (1914-1999), attended by members of our Division.

In connection with all of the above, at the end of the year, a special meeting of the Division was held (November 29, 2019), at which 7 lectures on the mentioned topics were held (listed here in both Cyrillic and Latin):
1. Д. Радивојевић: *William „Strata" Smith (1769-1839), отац енглеске геологије – 250 година од рођења* / D. Radivojević: *William „Strata" Smith (1769-1839),the father of English geology – on occassion of 250 years of birth*.

2. Љ. Рундић: *Академик Љубомир Клерић (1844-1910)* / Lj. Rundić: *Academician Ljubomir Klerić (1844-1910).*

3. В. Јовић: *Светолик Стевановић (1869-1953)* / V. Jović: *Svetolik Stevanović (1869-1953).*

4. Љ. Рундић: *Јеленко Михаиловић (1869-1956)* / Lj. Rundić: *Jelenko Mihailović (1869-1956).*

5. Д. Јевремовић: *Академик Милан Луковић (1889-1972)* / D. Jevremović: *Academician Milan Luković (1889-1972).*

6. Т. Гаудењи: *Јубиларне поштанске марке као део активност Секције за историју геологије СГД* / T. Gaudenyi: *Jubilee postage stamps as part of the activities of the SGS Geology History Section*.

7. Љ. Рундић и А. Маран Стевановић: *Спомен-кућа Академика Петра Стевановића* / Lj. Rundić & A. Maran Stevanović: *The Memorial house of Academician Petar Stevanović.*

All the materials were printed in the form of extended abstracts in the last issue of *Reports of Serbian Geological Society for year 2019* (http://ebiblioteka.sgd.rs/collections/show/1)

Jubilee postage stamps marking the 150th anniversary of the birth of S. Stevanović (left) and J. Mihailović (right)

Prof. Ljupko Rundić INHIGEO-SRB

Slovakia

On September 1, 2019 **Peter Konečný**, PhD. became the new head of the Slovak Mining Archives in Banská Štiavnica, which preserves and presents to public archival documents related to mining, metallurgy, and geology. He studied history in Slovakia and history of science in Germany, received his PhD. at the Slovak Academy of Sciences and he was a Postdoc at the Max Planck Institute for the History of Science in Berlin. His research concentrates on history of mining travels, education of mining experts (in mining academies), history of early steam engine technology and history of earth sciences before 1850.

SPAIN

Many diversified activities can be reported from the Spanish INHIGEO group.

On February 11, 2019, the Geological Society of Spain (SGE) organized the II Conference on Women and Geology. ESTER BOIXEREU VILA, member of INHIGEO, gave the presentation *Pioneering Women professional Geologists in Spain.*

The Madrid association: Sociedad de Amigos del Museo Nacional de Ciencias Naturales, has organized the following conferences:

*February 19, 2019, ANTONIO ROSAS and DANI MEDIAVILLA: *The fossils of our evolution.*

*April 25, 2019: CARLOS BRIONES, IVÁN BARRENETXEA and MARGARITA HERNÁNDEZ: *Presentation of the book: Autobiography of Charles Darwin*

* December 10, 2019: MARGARITA HERNÁNDEZ LAILLE: *Lucia Sapien's diary. In the footsteps of Charles Darwin in Argentina*.

On March 5, in the Sciences Faculty at Granada University, SERGIO MARTOS ROSILLO presented the book: *El agua subterránea en la historia: De cómo la humanidad se ha abastecido mediante aguas subterráneas desde el Paleolítico hasta la época de las catedrales góticas* (Planeta Tierra, 2018). The other authors of the book are RAQUEL MORALES GARCÍA and JUAN JOSÉ DURÁN VALSERO.

From March 6 to 8, 2019, at the Complutense University of Madrid, the Workshop *Earthquakes and tsunamis in Iberia (50th years of the Saint Vicent Earthquake, M = 8.0)* was held. One of the invited speakers, Professor MARÍA ANA BAPTISTA, from the University of Lisbon, spoke about *Tsunamis in Iberia*.

On March 24, 2019, at the Geological and Mining Survey of Spain (IGME), Professor SCHLOA SHARPER, from the University of York (UK), gave the conference *André Allar, Sculpture and Science at the end of the century.*

From March 28 to July 2019, in the Faculty of Geological Sciences of the Complutense University of Madrid, the exhibition *Hydrocarbons in daily life* has been held. At the opening ceremony, JUAN GARCÍA PORTERO, from the Sociedad de Hidrocarburos de Euskadi (SHE), spoke about the contribution of hydrocarbons to the development of society.

On April 2, 2019, the book by JUAN JOSÉ DURÁN VALSERO, entitled *Palabrero Geológico*, was presented at the Geological and Mining Survey of Spain (IGME).

On April 8, 2019, on the occasion of Expoforum Valencia, at the College of Biologists of Valencia, JESÚS IGNACIO CATALÁ GORGES gave the conference *Las colecciones de historia natural en la Valencia de la Exposición Regional* (Natural history collections in Valencia from the Regional Exhibition).

On April 24, 2019, at the Geological and Mining Survey of Spain (IGME), was held the exhibition: *The Geology of National Parks was inaugurated, which has been active throughout the year*.

On April 28, 2019, CARLOS MARTÍN ESCORZA, member of INHIGEO, gave the conference *El Agua en la Mérida romana: Puente sobre el Guadiana, acueducto, presa de Proserpina y balneario de Alange*, (The water in the Roman Merida: Bridge over the Guadiana, aqueduct, Proserpina dam and Alange spa), within the framework of the Sociedad de Amigos del Museo Nacional de Ciencias Naturales.

On May 11 and 12, 2019, Geolodía (Geoloday), or day of Geology, in recent years has been celebrated, the result of the continued involvement and voluntary work of many professionals. It is an outreach initiative, with geological excursions through the field guided by geologists, open to all audiences. Since 2012, every year, a Geoloday is carried out, for each of the Spanish provinces, in the first fortnight of May. Geolodies take place in environments of great geological interest and offer simple but rigorous information. Likewise, they sometimes try to highlight the value of the history of Geology, as well as our geological heritage and the need to protect it.

On May 23, 2019, OCTAVIO PUCHE RIART, member of INHIGEO, gave the conference *History of Copper Metallurgy until the Middle Ages*, within the course History of Copper Metallurgy in Huelva, organized by the Atlantic Copper Chair of the University from Huelva.

In June 2019, the Gómez Pardo Foundation (FGP) of the Polytechnic University of Madrid, the Geological and Mining Survey of Spain (IGME) and the Spanish Society for the Defense of Geological and Mining Heritage (SEDPGYM) signed an agreement for the creation of the Center for Studies and Research of Geological and Mining Heritage. The Center is directed by, the member of INHIGEO, LUIS FELIPE MAZADIEGO MARTÍNEZ, with the collaboration of OCTAVIO PUCHE RIART, member of INHIGEO, and JUANA VEGAS DE SALAMANCA.

On July 19, 2019, at the Center for Human and Social Sciences of Madrid, of the Higher Council for Scientific Research (CSIC), JESÚS IGNACIO CATALÁ GORGES gave the conference: *La difusa distinción entre profesionales y aficionados: intentos de hacer carrera entre los naturalistas españoles de la Segunda República* (The diffuse distinction between professionals and amateurs: attempts to make a career among naturalists Spanish of the Second Republic).

From July 22 to 26, 2019, the Summer University of Teruel, has held the course entitled *Paleontology and development.*

From 3 to 14 September 2019, the Open Door Days were held at the Somosaguas paleontological site, Madrid, organized by the Grupo de Investigación PaleoGeoBiológica of the Complutense University of Madrid.

From September 3 to 24, 2019, in the Municipal House of Culture of Crevillente, the summer course of the Miguel Hernández University was held, entitled: Jiménez de Cisneros pioneer of geological research in the South of Alicante. On November 18 the exhibition was opened in this same place: *Daniel Jiménez de Cisneros. El inicio de la investigación geológica y paleontológica en la sierra de Crevillente* (Daniel Jiménez de Cisneros. The start of geological and paleontological research in the Sierra de Crevillente).

From September 23 to 29, 2019, the XVIII International Congress of Geological and Mining Heritage, organized by the Spanish Society for the Defense of Geological and Mining Heritage (SEDPGYM), was held in Ponferrada, León. This scientific society publishes the magazine *De Re Metallica*, directed, by the member of INHIGEO, ESTER BOIXEREU VILA. This year it publishes a special number (June-December 2019) dedicated to the *History of oil*.

From 3 to 4 October 2019, at the CSIC Institute of History, Madrid, the symposium Scientific collecting and the museum representation of Nature and Humanity was held, where we highlight the communication by ISABEL RÁBANO (member of INHIGEO) and JUAN PIMENTEL on: *Teresa Madasú: gender, geology and art in 19th century Spain*.

On October 4, 2019, CARLOS MARTÍN ESCORZA, a member of INHIGEO, led an excursion by the Society of Friends of the National Museum of Natural Sciences to the Roman mines of Las Médulas, in the province of León.

From November 7 to 9, 2019, the III International Congress on salt: Historical exploitation of salt was held in the town of Peralta de la Sal, Huesca. The organization was carried out by the Centro de Estudios Literanos, Spanish Society for the History of Archeology (SEHA), Spanish Society for the Defense of Geological and Mining Heritage (SEDPGYM), Institute of Heritage and Landscapes of Salt (IPAISAL) and the International Society of Geology and Mining for the development and management of the territory (SIGMADOT).

On November 18, 2019, at the Crevillente City Council House of Culture, the exhibition *Daniel Jiménez de Cisneros el inicio de la investigación geológica y paleontológica en Crevillent* was inaugurated.

At the 67th Scientific Meeting of the Geological Society of Spain, held in Peñarroya-Pueblonuevo, Córdoba, on November 22 and 23, 2019, MIGUEL LEÓN GARRIDO, presented the communication: *Aspectos geológicos en la Historia del Reino de Quito en la América meridional (1844), de Juan de Velasco*.

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ESTER BOIXEREU-VILA and OCTAVIO PUCHE-RIART

SWEDEN

Christer Nordlund:

Publications:

Christer Nordlund, "The will of an Ice Age sceptic", *in*: Johan Kärnfeldt, Karl Grandin and Solveig Jülich (eds.), *Knowledge in Motion: The Royal Swedish Academy of Sciences and the Making of Modern Society* (Göteborg: Makadam, 2019).
Kristina Espmark and Christer Nordlund, "Astrid Cleve von Euler on Ytterbium and Selenium", *in*: Annette Lykknes & Brigitte Van Triggelen (eds.), *Women in their Element: Selected Women's Contributions to the Periodic System* (Singapore: World Scientific, 2019).
Christer Nordlund, Vetandets världar: Texter om vetenskap, samhälle och historia [Worlds of Knowing: Essays on Science, Society and History] (Umeå: h:ström – Text & kultur, 2019).
Erland Mårald & Christer Nordlund, "Modern Nature for a Modern Nation: An Intellectual History of Environmental Dissonances in the Swedish Welfare State", *Environment and History* (forthcoming 2020).

SWITZERLAND

Tina ASMUSSEN (Science Studies, ETH Zürich)
Articles and book chapters:

Tina Asmussen, Pamela O. Long, "Introduction. The cultural and material worlds of mining in early modern Europe", *in*: Tina Asmussen (ed.) *The Cultural and Material Worlds of Mining in Early Modern Europe*, Special Issue: *Renaissance Studies* 34.1, 2020, 8-30.

Tina Asmussen, "Wild Men in Braunschweig. Economies of Hope and Fear in Early Mode Mining", *in*: Tina Asmussen (ed.) *The Cultural and Material Worlds of Mining in Early Modern Europe*, Special Issue: *Renaissance Studies* 34.1, 2020, 31-56.

Tina Asmussen, Lucas Burkart and Hole Rößler, "Einleitung", *Musaeum Celeberrimum (1678). Band 11 der Werkausgabe: Athanasius Kircher. Hauptwerke*, Anne Eusterschulte, Olaf Breidbach, Wilhelm Schmidt-Biggemann (eds.), Hildesheim: Olms Verlag 2019, 9-108.

Tina Asmussen "Pfade durch die Alpen: Eine Einleitung", Tina Asmussen (ed.), *Montan-Welten. Alpengeschichte abseits des Pfades*, Zürich: intercom Verlag, 2019, A1-A10, (online: aether.ethz.ch).

Tina Asmussen, Sascha Müller, "Gletscher im Flacon", Tina Asmussen (ed.), *Montan-Welten. Alpengeschichte abseits des Pfades*, Zürich: intercom Verlag, 2019, J1-J17, (online: aether.ethz.ch).

Talks:

"Arme Erze als Ressource: Wissen und Ökonomie im europäischen Bergbau der Frühen Neuzeit", Berufungsvortrag Juniorprofessur für Bergbaugeschichte der Frühen Neuzeit, Deutsches Bergbau-Museum, Bochum, 18 October, 2019.

"Rich Ores and Barren Rock: A Material History of Finding in Sixteenth- and Seventeenth-Century", INHIGEO Conference, Como, 3 September 2019

"The Lure and Corruption of Saturn in Sixteenth-Century Central European Mining and Metalworking", Talk in the Panel: *Nature and Desire. Ioan Petru Culiano's Éros et la Magie à la Renaissance*, History of Science Society, Annual Meeting, Utrecht, 27 July 2019.

"Verheißungsvolle Erze. Bergbau und Risiko im frühneuzeitlichen Harz", Frühneuzeit Kolloquium, University of Rostock, 4 June 2019.

With Nils Güttler, "Publish or Perish. History and Future of Scientific Publishing", D-GESS, ETH Zürich, 31 May 2019.

"La promesse des métaux. Histoire culturelle de l'exploitation minière en Allemagne au XVIe siècle", plenary lecture at the *Centre d'Études Supérieurs de la Renaissance*, Tours, 27 May 2019.

"Promising Futures. Knowledge and Affects in the Early Modern Harz Mountains", Frühneuzeit Forum, University of Zürich, 15 April 2019.

"Mineral Knowledge and Antiquarian Practice in Late Sixteenth-Century Basel", Symposium: Prudence, Techne and the Practice of Good Government in the Early Modern Kunstkammer, organized by Andrew Morrall and Mark A. Meadow, Bard Graduate Center, New York, 12 April 2019.

UNITED KINGDOM

We have very little reportage this year, undoubtedly because the call for contributions unfortunately coincided with the COVID-19 outbreak and related lockdown mandated by the four national governments of the UK, and the ensuing disruption to personal and professional life. University staff in particular had to shift with very little notice to distance teaching based at their homes. I hope that matters will have returned somewhat to normal by this time next year, but for now here is what has been sent in.

Perhaps the most important news for INHIGEO is Edinburgh University's securing of the Lyell notebooks – reported elsewhere in this issue by **Andrew Grout**.

John Henry has also submitted the usual annual report on the History of Geology Group, published elsewhere in this issue.

John Mather 'has nothing much to report, I'm afraid, with no new publications in 2019. A paper on the Cornish geologist Eileen Mary Lind Hendriks is in press. Hendriks found plant remains in the supposedly Silurian rocks of South Cornwall which led to a complete reinterpretation of the stratigraphy and structure of the area, forcing the Geological Survey to revise their maps and memoirs. I gave a presentation on the Harrogate Well Case of 1837 at the autumn History of Geology Group

meeting in York and am presently writing this up. Also, in preparation are articles on the Torquay amateur geologist Arthur Roope Hunt and the Survey geologist W. A. E. Ussher, the centenary of whose death is being marked in 2020.'

Martin Rudwick reports: 'In April 2019 I took part in a conference held at the Society of Antiquaries (London) on "Antiquarian Science in the Scholarly Society", focussed on 18th-century antiquarianism. My paper, on "Volcanoes and vases: naturalists, antiquaries, and the mobilisation of images", took Sir William Hamilton's twin scholarly fields as a distinguished example of the close relation between geology and archaeology (both terms *avant la lettre*), not least in their intensive use of visual imagery, in the late Enlightenment. In May 2019 at the University of Amsterdam, I was invited by the Vossius Centre to take part in a workshop on "Deep history in the long 18th century"; as its opening event I gave a public lecture on "From natural history to the history of nature".

On both these occasions I drew on material already published in my *Bursting the Limits of Time* (Chicago, 2005); but they served to introduce younger scholars from several countries to some historical issues around both the historicisation of the natural world and the modern divide (notably in the anglophone world) between sciences and humanities.'

Ralph O'Connor and **Mike Taylor** are completing the proofs of their new edition and critical study of Hugh Miller's *The Old Red Sandstone* for National Museums Scotland Publishing. They have also completed, with Leslie Overstreet, a study of the surprising story of the various editions and issues of Miller's *The Testimony of the Rocks*, to go with Mike's examination of Miller's printing operation in Edinburgh.

O'Connor, R. 2019. 'Geology and paleontology', pp. 401-413 in Denisoff, D. and Schaffer, T. (eds) *The Routledge companion to Victorian literature*. Routledge, London.

Mike Taylor has also prepared revised editions of his biography of Hugh Miller, and of Miller's *Cruise of the Betsey*, for NMS Publishing. He has written up the Independent (also known as Congregationalist) minister John Gleed of Lyme Regis in Dorset. Gleed is of interest for his role as a fossil collector and vendor, and pastor to the collector Mary Anning's family (and, it turns out, landlord to one of them). This has led to a second paper on Anning's family homes and shops and the tales of her being flooded out by the sea, and a third with Richard Bull of Lyme Regis Museum on the location of her famous shop of the 1820s – not a trivial matter given the visiting public's interest in Anning, and the fact that the shop was located somewhere on the Museum site. Closer to home, at HOGG's enjoyable Edinburgh meeting in July 2019, Mike spoke on the Edinburgh replica of the dinosaur *Hadrosaurus*. He is now wondering just how many copies were made by Waterhouse Hawkins for display at Philadelphia, Princeton and elsewhere.

Taylor, M. A. 2020. 'Rude bones' under the cataract: Lyellian geology in Tennyson's *The Princess*. *Tennyson Research Bulletin* 11, 265-269.

Mike Taylor

UNITED STATES OF AMERICA

Victor R. Baker presented two invited history of geology papers at special sessions of the Geological Society of America Annual Meeting in Phoenix, Arizona. In the G.K. Gilbert Session on "Thrilling Discoveries in Planetary Geology and Geophysics" he presented the paper "50 Years of Imaging Fluvial Features on Mars: A Continuing History of Thrilling Discovery" (published in *GSA Abstracts with Programs*, v. 51, no. 5 doi: 10.1130/abs/2019AM-337739). In a session on "Great Concepts and Controversies in Geosciences since Steno's Introduction of the Principles of Statigraphy in 1669" Vic presented the paper "Cataclysmic Flooding and Catastrophism: 350 Years of Geological Controversy" (published in *GSA Abstracts with Programs*, v. 51, no. 5 doi: 10.1130/abs/2019AM-337828).

Vic also reports making progress on his long-standing book project dealing with the history of the 19th-century controversy concerning the origin of slaty cleavage, and he initiated a new book project dealing with the history of geological studies of the planet Mars. Finally, he initiated a historical study of philosophical inquiries through the ages relevant to the nature of geological thinking in general. All of this is continuing to keep him occupied during the 2020 period of "shelter in place" and "social distancing."

Kennard B. Bork contributed a chapter for the Geological Society of America's upcoming (2020) book *The Evolution of Paleontological Art*. The specific title of the article is "The Illustrations of Brongniart and Cuvier Illuminate Paleontology in the Early Nineteenth Century." Jan Kozak and Roger Musson's impressive book *The Illustrated History of the Elements: Earth, Water, Air, Fire* (Springer, 2020) contained Ken's Foreword. INHIGEO members will enjoy the book's striking visuals and informative narrative recounting the evolution of artistic and scientific treatment of natural disasters.

Eric Brevik published a paper in *Progress in Physical Geography* (Miller *et al.* 2019) that included significant discussion of the historical links between soil science, physical geography, and geology. He also coauthored a publication in *Catena* that provided a review of the history of geodiversity studies (Ibáñez and Brevik 2019). He gave a talk at the January 2019 meeting of the Soil Science Society of America that discussed the importance of George Nelson Coffey, who was trained as a geologist, to early soil science in the USA (Brevik 2019a). Finally, he put together a brief history of the soil health concept for the Soil Science Society of America (Brevik 2019b).

Publications:

Brevik, Eric C. 2019a. George Nelson Coffey's "A study of the soils of the United States": Importance to soil science and personal impact. *Soil Science Society of America Annual Meeting Abstracts*. Abstract #115287.

_____2019b. A Brief History of the Soil Health Concept. The Profile. https://profile.soils.org/posts/field-and-historical-notes/a-brief-history-of-the-soil-health-concept.

Ibáñez, Juan-José, and Eric C. Brevik. 2019 A Review of Methods in Natural Diversity Studies: The Need for Standardization. *Catena* 182:104110. https://doi.org/10.1016/j.catena.2019.104110

Miller, Bradley A., Eric C. Brevik, Paulo Pereira, and Randall J. Schaetzl. 2019. Progress in Soil Geography I: Reinvigoration. *Progress in Physical Geography: Earth and Environment* 43(6): 827-854. https://doi.org/10.1177/0309133319889048

William R. "Bill" Brice completed his fourth and final year as INHIGEO editor and his letter to the membership is found at the beginning of this issue. His four-year term concludes with the publication of the *INHIGEO Record Number 52* for 2019. Bill continued his involvement with the Petroleum History Institute and served as Co-Chair for the Annual Meeting held in Saint John, New Brunswick, Canada, June 27-29, 2019, and he continues to serve as a Second Vice-President of PHI. Bill also serves as an Associate Editor for *Earth Sciences History*.

Publications:

BRICE, William R. 2019d, Petroleum History Institute Annual Meeting and Field Trip; Saint John, New Brunswick, Canada, June 27-29, 2019: *Oil-Industry History*, v. 20, No. 1, p. 1-16.

_____, 2019c, Petroleum History Institute annual meeting and field trip; Salt Lake City, Utah, July 17-19, 2018 (Abbreviated): IHIGEO Annual Record, No. 51: International Commission on the History of Geological Sciences, Johnstown, PA, p. 34-35.

_____(Editor), 2019b, IHIGEO Annual Record, No. 51: International Commission on the History of Geological Sciences, Johnstown, PA, 237p.

_____(Editor), 2019a, *Program and Abstracts*: Petroleum History Institute Annual Oil History Symposium & Field Trip, Saint John, New Brunswick, Canada, June 27-29, 22 p.

Presentations:

BRICE, William R., 2019, The Drake Well and unintended consequences: School of Geography, Geology and the Environment, Keele University, Keele, England, UK, October 18 (Invited Speaker).

Book Reviews:

Brice, William R., 2019c: Environmental Considerations Associated with Hydraulic Fracturing Operations; Adjusting to the Shale Revolution in a Green World; By James A. Jacobs and Stephen M. Testa: *Oil-Industry History*, v. 20, No. 1, p. 79-81.

_____, 2019b: History of the European Oil and Gas Industry; Edited by: J. Craig, F. Gerali, F. MacAulay, and R. Sorkhabi: *Earth Sciences History*, p. 434-435.

_____, 2019a: History of the European Oil and Gas Industry Edited by: J. Craig, F. Gerali, F. MacAulay, and R. Sorkhabi: *IHIGEO Annual Record*, No. 51: International Commission on the History of Geological Sciences, Johnstown, PA, p. 81-82.

Renee Clary was elected a Fellow of the Geological Society of America in 2019, through the History and Philosophy of Geology Division. She was also elected a Fellow of the American Association for the Advancement of Science through the Geology and Geography Division.

She published the second woman "Rock Stars" feature in *GSA Today*, focused upon Mary Anning:
Clary, R. M. (2019). Mary Anning: She sold (fossil) seashells by the seashore. *GSA Today*, 29(5), 62-63.

With co-editors Gary Rosenberg and Dallas Evans, Renee is editing a forthcoming Geol. Soc. Amer. Special Volume, *Evolution of Paleontological Art*, with contributions from an international group of approximately 30 historians, geologists, and artists.

Conference Presentations:
Renee participated in the 2019 INHIGEO conference in Como-Varese, Italy, contributing a paper on informal communication within letters and field notebooks during the Golden Age of Geology (1788-1840). At the Mississippi Academy of Sciences, she presented a paper on De la Beche's pioneering illustration, "Duria antiquior."

Service:
Renee is President-Elect of the History of Earth Sciences Society. In the Geological Society of America's History and Philosophy of Geology Division she serves as the webmaster, and she is also the permanent representative of the Joint Technical Program Committee for the division. She continues to serve as the GSA History and Philosophy of Geology Division's Chair of the Awards Committee, and she is an editor for the "Rock Stars" series published within *GSA Today*.

John A. Diemer continued to serve as editor of *Earth Sciences History*, editing two numbers of Volume 38 in 2019:
Diemer, J. A. 2019. Earth Sciences History. Volume 38, Number 1, pp. 1-156. Editor's Introduction, p. iv.
Diemer, J. A. 2017. Earth Sciences History. Volume 38, Number 2, pp. 157–442. Editor's Introduction, p. iv.

Conference papers presented:
Diemer, J. A., 2019. The geology of the Ural Mountains as understood by Roderick Murchison in 1845. INHIGEO Annual Meeting, Varese, Italy, September 2–7, 2019.
Diemer, J. A., 2019. An early application of system nomenclature to the Paleozoic of southern Norway. European Geosciences Union (EGU) Annual Meeting, Vienna, Austria, April 7–12, 2019.

Greg Good published an article in 2018 that was not mentioned last year: "John Herschel's Travels through the Alps to the Cosmos in the 1820s," *in* Fabio D'Angelo, ed., *The scientific dialogue linking America, Asia and Europe between the 12th and the 20th Century. Theories and techniques travelling in space and time*, Ebook – Viaggiatori. Circolazioni scambi ed esilio, Naples: Associazione culturale Viaggiatori, 2018, pp. 288-291.

In 2019, he published "Geophysics in Japan in the Late 19th and Early 20th Centuries," *Historia Scientarum: International Journal of the History of Science Society of Japan*, 28(3): p. 187-200.

He also presented talks on geo-history: Between the Sun and the Earth, Between Science, Environment, and Technology (CHSTM Working Group on History of Physical Sciences); One from Many: The Origins and Continual Re-creation of the International Union of Geodesy and Geophysics (IUGG Centennial, Montreal, keynote); Notes toward a New Historiography of John Herschel (HSS Annual Meeting); The Astronomers who fell to Earth: Or, How the Copernican Revolution was Completed in the Alps (INHIGEO Annual Meeting, Verese, Italy); and Comments on Culture, Science, and Change (CAST conference, Beijing, China).

Sandra Herbert reports two items:
(1) The Council of the Geological Society of London awarded her the Sue Tyler Friedman Medal for 2020. The Medal is awarded for "distinguished contributions to the recording of the history of geology."

(2) Sandra's play "Castle on the Mall" is now ready for reading. It is a dramatization of Joseph Henry, the first Secretary of the Smithsonian Institution, and his family during the Civil War years. It will be of interest to INHIGEO members who like plays with a scientific/political theme. Contact Sandra for a pdf of her play.

Léo Laporte's essay "ANTHROPOCENE: A PARADIGM, NOT STRATGRAPHY" was posted on the GSA website (Community News section) and he is coauthor with Jody Bourgeois and Michele Aldrich of a forthcoming GSA Rock Stars article: "Lou Henry Hoover (1874-1944)."

Kerry Magruder reports that The University of Oklahoma History of Science Collections has established a new archive for the History of Geology. The purpose of this archive is to preserve and make available the papers of historians of geology. Many historians of geology do not work in an institutional setting that offers an appropriate and accessible archive, so we hope that this initiative will fill a need and facilitate the continuing work of future scholars who build upon the work of the present generation. We are committed to open access as much as possible, and to digitization when feasible. The initial collections at launch include papers of the following historians: Martin Rudwick, Hugh Torrens, Kenneth L. Taylor, Léo Laporte, Alexander Ospovat, and David Kitts. Special thanks is due to Ken Taylor for his assistance and advice, and to Hugh Torrens and Martin Rudwick who welcomed Kerry to their homes in October 2018 and June 2019 to select and preserve over 100 FedEx boxes of papers which were sent back to Oklahoma on those occasions. Additional collections will be solicited once these are processed. The University offers short-term fellowships to cover travel and lodging to use the archives. Contact Kerry for more information.

Cliff Nelson continues to prepare for publication his narrative analysis of the reorganization and improvement of federal mapping and science in Gilded Age America, principally within the wider context of the political reforms during the 1877-81 administration of President Rutherford Hayes. Coverage extends from 1867 to the death of the last principal participant in 1918.

Sally Newcomb gave a talk titled "The Controversial Granite Controversy" at the Phoenix meeting of the Geol. Soc. Amer., in a session titled "Great Concepts and Controversies in Geosciences since Steno's Introduction of the Principles of Stratigraphy." She continues adding to the American Institute of Physics site, *Ex Libris Universum*, blogging about books in their Wenner collection in the Niels Bohr Archives. Two were posted in 2019. The first was *Kelvin, Wenner, and the Age of the Sun and Earth* (a report on three papers of Kelvin's in the Wenner collection). The second was *Atomic Relations: John Dalton* (about a reprint of Dalton's *A New System of Chemical Philosophy*). Sally spent a fair part of the year getting acquainted with a 12 volume set of Buffon's, *Supplément ã l'Histoire Naturelle*, published from 1774 to 1776, which was posted early in 2020, and she is now untangling the thoughts of G. N. Lewis and I. Langmuir on the octet theory of chemical valence via their papers of 1916 and 1919.

Steve Rowland attended the INHIGEO meeting in Varese, Italy where he presented a paper titled "Fritz Zerritsch's mid-twentieth century history-of-life wall chart roll-ups and his collaboration with paleontologist Erich Thenius." He also submitted a chapter exploring the "pageant-of-life-through-time" genre of paleontological art for publication in a forthcoming Geol. Soc. Amer. book *Evolution of Paleontological Art*. Another chapter, coauthored by Robert Peck, on the paleontological art of Waterhouse Hawkins has also been submitted for publication in the same GSA special volume. Steve continues as an associate editor of *Earth Sciences History*, Vice President for North America of INHIGEO, and a member of the editorial team for "Rock Stars" articles published in *GSA Today*.

David Spanagel reports that the highlights of the past year included the following. During the spring term (March-April 2019), he developed and taught an entirely new theme (focusing on the life and scientific achievements of Albert Einstein) for his HI 3331 Topics in the History of European Science and Technology seminar class. During the early summer term (May-June 2019) he once again guided scholarly independent study projects covering all the humanities and arts disciplines for Worcester Polytechnic Institute (WPI) students at the London (England) Project Center. In September, WPI sent David as its designated Faculty Mentor (along with two undergraduate students) to attend the week-long Grand Challenge Scholars Program International Summit in London. While there, he supervised a mixed team of undergraduate students composed of two Americans, two Chinese, and two British, as they competed in a Grand Challenges innovation hack-a-thon activity. In October, he presented his paper "Putting Science to the Test: Initiating the World's Longest Unfortified Boundary" at the American Philosophical Society's "The Power of Maps and the Politics of Borders" conference, held in Philadelphia, Penn.

Kenneth Taylor's English translations (with notes and commentary) of two articles by Nicolas Desmarest published in the *Encyclopédie* have been posted at the Encyclopedia Translation Project site (https://quod.lib.umich.edu/d/did/): *Physical Geography*, and *Basalt of Auvergne*. (The latter is grouped with the plates, under the heading Natural History, Mineral Kingdom, Sixth Collection.)

Steve Rowland

Uzbekistan

Events

On January 30, the Embassy of Uzbekistan in the United States was organized video conference for negotiations between the leadership of the State Committee of the Republic of Uzbekistan for Geology and Mineral Resources and senior representatives of the US Geological Survey (USGS). The prospects for cooperation in the field of geological exploration of mineral resources were discussed[22].

On February 7, in Tashkent were discussed the prospects for cooperation in the field of evaluation of mineral resources. Attending from the US Geological Survey was I. Verstreten, Program Manager for Europe, Russia, Central Asia and the Arctic, and W. Guidroz, Program Coordinator for Energy Resources[23].

Project proposals have been prepared for the Memorandum of Understanding, including the assessment of mineral resources, remote sensing of the Earth, and the study of groundwater.

In May, a meeting of leading scientists from research academic and industrial institutes and the faculty of Universities held at the National University named after Mirzo Ulugbek.

Conferences

On September 17-18, the International Scientific Conference dedicated to the 15th anniversary of the Central Asian Institute of Applied Geosciences (CAIAG) was held in Bishkek (Kyrgyzstan). Conference was organized by CAIAG in collaboration with the German Center for Earth Research (GCER) and Institutes of the National Academy of Sciences of the Kyrgyzstan. Proceeding "Remote and Ground-Based Earth Observation in Central Asia" contains "up-to-date data on interdisciplinary monitoring of the study of the geodynamic processes of the Earth and the comprehensive study of water resources and the impact of changes in climatic conditions in order to reduce geo-risks and adapt the population" (Ed. B.Moldobekov, 268 pp.). The goal is to consider and discuss the most important results of applied and theoretical work over the past 5 years based on the interdisciplinary use of modern remote and ground-based Earth surveys, obtained on the basis of the established and functioning latest network for monitoring environmental changes within the transboundary regions of Central Asia. Uzbek specialists (V. D. Minchenko, B. S. Nurtaev) were attended in conference.

On October 10-11 two Conference at the same time were held in Tashkent.
The I International Scientific and Practical Conference on "The role of science and practice in enhancing and actualizing the risk management of the manifestation of exogenous geological processes" dedicated to the 25th anniversary of the State Tracking Service (1994-2019) and the 60th anniversary of the Landslide Service of Uzbekistan (1958-2018)[24].

The goal is the effective use of the capabilities of scientific and industrial organizations, discussion of achievements and modern problems of engineering-geological, hydrogeological and geoecological studies to determine their solutions using innovative, technical achievements in the study of different natural and technogenic dangerous geological processes. The conference is dedicated to the development of practical measures to implement priority areas of activity to achieve the main goals of the Sendai Framework Program, linked to measures to implement the National Goals and Tasks in the Field of Sustainable Development of the Republic of Uzbekistan for the period up to 2030 (approved by the Resolution of the Cabinet of Ministers of October 20, 2018 No. 841).

Proceeding includes 73 scientific papers from Czech Republic, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Uzbekistan (Ed. B. F.Islamov. - 268 pp.). The following have interest to the history of geology:
1) The history of the formation of the landslide service of Uzbekistan (G. A. Bimurzaev, B. I. Tulyaganov);
2) 60 years of the landslide service of Uzbekistan - through the eyes of the Uzbek-Czech cooperation (P. Blaga, R. A. Niyazov, Sh. Kh. Abdullaev);
3) Thirty-eight years of cooperation on the Mingchukur landslide (the same authors);

[22] http://old.uzgeolcom.uz/ru/press_center/news/uzbekistan/30-yanvarya-2019-goda-provedena-videokonferentsiya-mezhdu-goskomgeologii-i-geologicheskoy-sluzhboy-s/?sphrase_id=6101
[23] http://old.uzgeolcom.uz/ru/press_center/news/uzgeolcom/7-fevralya-2019-goda-v-gosudarstvennom-komitete-po-geologii-i-mineralnym-resursam-respubliki-uzbekis/
[24] https://www.uzgeolcom.uz/en/news/117

4) State tracking service: the history of formation and its prospects (B. I. Tulyaganov, G. A. Bimurzaev, A. A. Kadirkhodzhaev);
5) The role of climate change and anthropogenic impact on the number of landslide displacements in Uzbekistan over a 60 year observation period (1958-2019) (R. A. Niyazov);
6) Geoecological development of Uzbekistan (Kh. A. Toichiev, M. A. Abdullaeva, A. Kh. Tukhtasinov);
7) Long-term forecast of areas of expected seismic activation in Uzbekistan by a set of prognostic parameters of the seismic regime (T. U. Artikov, T. L. Ibrahimova, R. S. Ibrahimov, M. A. Mirzaev);
8) On the possible impact of tidal forces on the number of earthquakes in Asia (A. A. Starovatov, S. S. Khusamitdinov).

The International Scientific and Practical Conference on "Actual problems of oil and gas geology and innovative methods and technologies for developing the hydrocarbon potential of the subsoil", dedicated to the 60th anniversary of the Institute of Geology and Exploration of Oil and Gas Fields (IGIRNIGM).

Proceeding includes of 160 papers from Azerbaijan, Kazakhstan, Kyrgyzstan, USA, Russian Federation, and Uzbekistan (Ch. Ed. G. S. Abdullaev. - 640 pp.).
The following papers have interest for history of geology:
1) Abdullaev G. S. Implementation of the program for the development and reproduction of the mineral resource base of Uzbekneftegaz in the period of 2017-2021.
2) Akramkhodzhaev A. A. Discoveries of Uzbek oil industry workers and their contribution to the development of the world's oil and gas industry.
3) Khusanov A. S., Nurtaev B. S., Khusanov S. T., Ilyosov R. S. Comparative characteristics of the geological features of the Fergana (Uzbekistan) and Dzhungar (China) oil and gas basins in order to assess the prospects for the development of prospecting for oil and gas.
4) Antonov A. E. The role of end-to-end mineralogenic oceanic-continental systems (smoks) for localizing deposits of non-ferrous and noble metals, hydrocarbons.
5) Dunin-Barkovskaya E. A., Bulina N. V., Umarov A. Z. Paragenesis of sulfur and oil as a search criterion for the manifestations of oil and gas in sedimentary strata (on the 130th birthday of Academician A. S. Uklonsky).

In journal of "Geology and Mineral Resources" were published scientific articles related to the history of geology.
Akbarov H. A., Koldaev A. A., Turapov M. K. Sadykova L. R., Razikov O. T., Fathullaev B. Kh. An important achievement in the development of integrated research methods, searches and forecasting of gold deposits of Uzbekistan / Review of the monograph of M. M. Pirnazarov "Gold of Uzbekistan: ore-forming types, forecast-search models and complexes". - T.: SE "IMR", 2017. - 248 p. (Geology and mineral resources. - No. 3).

Anniversaries
70th birthday
DIVAEV FARID KARIBOVICH - a prominent researcher of geological bowels of Uzbekistan, candidate of geol.-min. sciences, member of the Uzbekistan Petrographic Commission and the Scientific Editorials Board on geological maps under the State Geology Committee of the Republic of Uzbekistan, author of more than 50 articles and co-author of 4 monographs (Geology and Mineral Resources. - No. 3).
TULYAGANOV BAKHODIRJON ISMAILOVICH - a leading specialist in the field of engineering geology and engineering geoecology, (Geology and mineral resources. - No. 5).
60th birthday
PIRNAZAROV MAZHID MAKHKAMOVICH - a well-known scientist in the field of metallogeny, geology of minerals, geochemical methods of prospecting, local forecasting and modeling of ore deposits in Central Asia, doctor of geol.-min. sciences, professors, author of about 170 scientific works, of which more than 140 are published, including eight monographs (Geology and Mineral Resources. - No. 3).
MARIPOVA SOADAT TORAKHANOVNA – the head of Sector of Geographic information technologies of the Center for Remote Sensing of the Earth GP "IMR", candidate of geol.-min. sciences, author of more than 40 published works, including two monographs (Geology and mineral resources. - No. 5).

Loss of science
Alla Alekseevna Kustarnikova passed away (1931-2019) - leading specialist in the field of regional geology, paleovolcanism and ore-bearing igneous formations, doctor geol.-min. sciences (Geology and mineral resources. - No. 5).

L. N. Lordkipanidze, B. S. Nurtaev, O. G. Tsay

APPENDIX A

INHIGEO VIRTUAL BIBLIOGRAPHY 2020

Germany, Italy, and Japan

Edited by Francesco Gerali, Project Curator

GERMANY

Schimkat, **Peter**, Astronomisch-Physikalisches Kabinett, Kassel.

Writing the History of Geology in Germany: An Overview, 1825-1967

In 1817, the renowned mineralogist Abraham Gottlob Werner died, leading to an extensive number of obituaries celebrating the life of the most famous teacher ever employed by the Bergakademie (= Mining Academy) Freiberg. One of those works was an extensive biography of Werner published by a native of Freiberg, Samuel Gottlob Frisch (FRISCH 1825). Frisch was by no means an expert in mining or mineralogy. He hailed from a family of Lutheran theologians and himself followed that path. At the time of writing his biography, Frisch served in nearby Dresden, as a preacher at the princely court of Saxony. Frisch's biographical account came with the primary intent to honour a recently deceased important local son of this German principality.

In spite of receiving help from Christian Samuel Weiß (a former pupil of Werner and by then professor for mineralogy at Berlin University), Frisch's book is short on detail concerning matters of interest to historians of the earth sciences. This said, it includes an interesting part: Frisch's interpretation of Wernerian mineralogy as a fundamentally theory-inspired system, based on the principle of a neptunist origin of virtually all rocks. Consequently, Frisch emphasized the prime importance of resulting debates with adherents of alternative volcanist explanations concerning the origin of rocks like basalt.

This clear-cut dichotomy doesn't do justice to the way Wernerian mineralogy was perceived by Werner's own contemporaries. The latter understood Wernerian mineralogy as a pragmatic way of ordering facts based on neat and clear rules of procedure; on the other hand, the importance of any underlying theoretical assumption was downplayed to the point of often being ignored completely. But as far as later generations were concerned, it was the interpretation included in Frisch's monography which gradually gained prominence. It might be debatable whether Frisch's account constitutes the first German work on the history of the earth sciences. However, it definitely is the first one which made a lasting impact in influencing and steering future perceptions of a bygone historical era in the development of geology.

The nearly 150 works listed here are, in my opinion, publications which likewise have partly exerted an influence on the further development of the writing of history of geology in Germany; some additional treatises of historical interest are included as well. This alphabetically ordered list covers the time-period from 1825 until 1967, the year INHIGEO was founded, but which, in addition, saw a remarkable number of other important activities taking place in Germany. Of those, the 1967 conference marking the 150th anniversary of the death of Werner took centre stage and led to a coherent collection of essays on Werner and his followers (RöSLER 1967), while in the same year, a young Martin Guntau[25] excelled with his first major work (GUNTAU 1967). Not least, with by now more than half a century having passed until present times, judgements concerning the true historical significance of those publications can readily be made.

These publications cover the area of science which by now would be classified under our modern term `geology'. But that doesn't always fit the 19th century perception of those who undertook what in retrospect we judge to have been geological work. The resulting problem is more marked in Germany than in most other countries: here, what's now called geology was traditionally an entity subsumed within the overarching field of Mineralogie. Even the term 'geology' itself wasn't used in a coherent manner at that time: a sizeable number of German scholars much preferred to divide it conceptually into two very distinct fields of descriptive Geognosie (devoted to finding the order of strata) and a Geologie understood as earth history (and often regarded as a non-essential afterthought). Even after Germans started to use the term in the way their international colleagues had been doing for decades, some peculiarities in the national style of German geology remained.

Up to 1967, publications devoted to the history of geology had a clearly defined audience: contemporary geologists. The vast majority of the works listed in this bibliography were written by still active geologists, and they often had the purpose of influencing current developments in geology. Indeed, their authors usually weren't shy to state explicitly the ulterior motive for utilizing historical arguments: as an added resource in scientific debates. As far as historical accuracy was concerned, the

[25] See the obituary section of this issue.

quality of these works varied considerably: some showed thorough factual research, but there also were influential articles only superficially acquainted with the topics discussed and sources used. In a few cases, they should best be treated as fiction altogether (Kurd von Bülow here being the worst offender, in my opinion).

Early lengthy publications (HOFFMANN 1838, KEFERSTEIN 1840) were in a style similar to the extensive historical accounts in textbooks from the 18th and 19th centuries: the authors collected what was hitherto available and passed their own (and often pretty scathing) judgment on all their predecessors. Later works in that vein were more measured, setting themselves the target to let facts speak for themselves, whether as a voluminous tome (ZITTEL 1899) or a short guide (HUMMEL 1925). That specific tradition never disappeared completely; a later adherent was the usually very diligent Max Pfannenstiel, writing from the 1940s to the 1970s.

Mostly, though, geologists writing on historical matters had motives which went way beyond a mere interest in history. In the 19th century, scientists arguing for the importance of the petrographic microscope tried all possible routes to convince their contemporaries that geology had entered a new glorious era, and they developed an historical account fitting for this specific purpose (VOGELSANG 1867, ZIRKEL 1881, ZIRKEL 1885). Which occasionally amounted less to an argument than to shouting at fellow geologists not sufficiently enlightened. A few decades later, the enigmatic Johannes Walther and his acolytes tried to convince their colleagues, that geology should be understood as earth history, and bolstered their case with a myriad of historical accounts as well (usually to be found as part of textbooks). Walther and his followers reduced the development of geology to an ever more successful attempt to prove the validity of a Waltherian perspective. Walther is the only author I have ever encountered who wrote a comprehensive short guide to the history of geology which managed to completely ignore both Hutton and Werner.

The case of Walther is an instructive example of a general feature in the history of geology: it usually was not the winners who wrote history (to quote a phrase whose exact origin is unknown but may be traced at least to Maximilien de Robespierre). It rather remained the domain of geologists more on the fringe of the field, trying to find a successful sideways angle to influence contemporary scientific debates. Some of them had an epistemological agenda: the most extreme case is Max Semper (SEMPER 1911, SEMPER 1914) who bemoaned what he interpreted as a lack of valid reasoning to arrive at geological conclusions, and strove to address that perceived wrong by imploring his colleagues to study the geological work of Johann Wolfgang von Goethe, for the sake of becoming better geologists themselves.

Semper had no interest in history for its own sake. Nevertheless, Semper's works are among the few publications ostentatiously dealing with historical topics which were written in the first three decades of the 20th century. Not that there were no historical accounts whatsoever, far from it. But in that specific time period, historical treatments were hidden in contributions to the then wide-reaching big debates taking place in Germany (how to include geological topics in school curricula; the nature of geology as pure-vs-applied science). Both debates kept geologists and their institutions busy for decades, and both led to an astonishing number of publications, which often included historical treatises and interpretations.

This situation changed from the end of 1920s: in the next 15 years, a flurry of genuine publications on the history of geology was published. The most prominent of those authors was Erich Haarmann, whose geological research was centered around tectonics. Haarmann was convinced that, for mountain building, vertical forces were more important than horizontal pressure, and gradually came to interpret the scolding disbelief of his geological colleagues (particularly the ones who studied the Alps) as the result of an uncritical adherence to an unfounded dogma. But wasn`t this anyway the natural course of events, born out by history: for the sake of geology, novel ideas always had to overcome unwarranted and small-minded resistance? At least, Haarmann himself was convinced of that. Deciding to move away from tectonics, he then wrote what amounted to a few hundred pages of historical works overall. Most of them a vendetta on anything Haarmann perceived as a stifling dogma. And usually displaying source material designed to back Haarmann's claims. These sources, alas, tend to be interpreted by Haarmann in such a ludicrous manner that it often defies belief or even logic. Peculiarly, Haarmann's geological colleagues, while dismissing his tectonics theory, seemingly saw no reason to question Haarmann's historical interpretations.

Haarmann's historical publications were part of developments within geology in Nazi Germany. There isn't much indication that, come 1933, Haarmann was enthusiastic about Germany's new rulers; however, Haarmann was encouraged in his historical work by geologists with close ties to the Nazi apparatus, and he enjoyed being a more visible figure in the geological community. All of Haarmann's papers were published in the major national journals. Some of those geologists supporting him, Karl Beurlen in particular, were on a crusade of their own to solve a heated debate: can geology be understood as a mere application of physics and chemistry?

Beurlen not only categorically denied this but connected his stance to notions of perceived race characteristics including ideas about unique German greatness. According to Beurlen (BEURLEN 1939), Mediterranean tribes had proven to be adept in any science based on logical deduction, and therefore they insist on shaping all of science in that image. But for the specific task of geology (whose aim, according to Beurlen, was the comprehensive study of any past epoch; there weren't many German colleagues who would have agreed) a more Nordic mindset was required. One with the ability to extract knowledge out of an unsorted mess of observations. That's why, according to Beurlen, geology is particularly suited for Germans, and works best if not stymied by rigid assumptions like, say, the principle of actualism.

There obviously wasn't a chance to display those types of arguments in the postwar years. And nobody did. However, the historical conclusions of the 1930s and 1940s (bereft of racist reasonings) made a remarkably easy transit. A number of them ended up 're-epistemologist', so to speak. In the 1950s, German works in the history of geology were presented within an idealist framework, including the generous usage of archetypical psychological profiles (whose interplay within scientific debates was utilized to explain the historical developments of geology). That continued to be the prominent stance in West Germany, at the time INHIGEO had been founded.

In the 1950s, this situation wasn't much different in East Germany either. The latter changed drastically in the 1960s: centralist attempts were made to establish a true Marxist-leaning history of geology. This involved the geological community as well as historians of science. Not all of the early discussions (usually published in the geological journals of East Germany) might have amounted to time well spent: the multitude of debates on the necessity of tying geology to the framework of scientific disciplines as envisioned a century earlier by Friedrich Engels (who, alas, didn't see geology as a distinct scientific discipline) looks positively nutty to anyone not converted to Marxism. And the notion of a severe neptunism-volcanism-debate fitted too nicely into the theoretical underpinnings of dialectic materialism for its true historical significance to be questioned.

What the new Marxist approach excelled in, however, was a renewed recognition of external factors surrounding the development of scientific fields of inquiry. Surprising as it might be to present historians of geology: the very idea of a real fundamental importance of external factors had been rather dormant within German publications for decades. While not going anywhere close to a sociology of scientific knowledge, the East German activities revitalized the concept of a comprehensive viewpoint which had to include both internal and external factors when judging historical developments.

Next to the topics mentioned so far, this bibliography includes influential works of other kinds as well: biographies, histories of Geological Surveys, of museums and of scientific institutions. These fields of historical research have usually been less influenced by contemporary trends as described above. But all of these publications taken together constitutes a body of work which is intended to give an overview on the development of the writing of the history of geology in Germany which hopefully might prove useful to the international readership of the INHIGEO Annual Record.

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(1948) Aus der Geschichte der Deutschen Geologischen Gesellschaft (Zeitschrift der Deutschen Geologischen Gesellschaft 100, S. 1-24)

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Heinrich Arndt
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Alfred Bentz
(1948) Die Entwicklung der Erdölgeologie (Zeitschrift der Deutschen Geologischen Gesellschaft 100, S. 188-197)

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(1939) Das Werden des erdgeschichtlichen Weltbildes im Spiegel großer Naturforscher und Denker aus zwei Jahrhunderten (Stuttgart: Ferdinand Enke)

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(1939c) Einige Bemerkungen zur Geschichte der Geologie (Zeitschrift der Deutschen Geologischen Gesellschaft 91, S. 236-252)

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Japan

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APPENDIX B **Affiliated Association**

INHIGEO Affiliated Associations
(Current as of June 2020)

International	History of Earth Sciences Society (HESS)
Argentina	Comisión Argentina de Historia de la Geología
Australia	Earth Sciences History Group, Geological Society of Australia (ESHG)
Austria	Austrian Working Group "History of Earth Sciences" (AWGHES)
China	Committee on the History of Geology, Geological Society of China
France	Comité Français d'histoire de la Géologie (COFRHIGEO)
Italy	History of Geoscience Section; Geological Society of Italy
Japan	Japanese Association for the History of Geosciences (JAHIGEO)
Poland	Section on the History of Geological Sciences; Polish Geological Society
Poland	Polish Geological Institute
Serbia	History of Geology Division, Serbian Geological Society (Srpsko geološko društvo - SGD) –
United Kingdom	History of Geology Group (HOGG), Geological Society of London
Venezuela	Sociedad Venezolana de Historia de las Geociencias

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APPENDIX C **Honorary Senior Members** July 2019

Addresses are provided in the 'INHIGEO Members' listing, along with an asterisk (*) before the last name and the designation 'HonSrMbr.' Listed alphabetically by last name.

Professor Kennard B. Bork, USA
Professor David F. Branagan, Australia
Dr Gabriel Gohau, France
Professor Algimantas Grigelis, Lithuania
Professor Aleksandar Grubic Serbia
Professor Léo F. Laporte, USA
Professor Lora N. Lordkipanidze, Uzbekistan
Professor Wolf Mayer, Australia
Professor Wojciech Narębski, Poland
Professor Sally Newcomb, USA
Professor Martin J. S. Rudwick, United Kingdom
Professor Janusz Skoczylas, Poland
Professor Kanemori Suwa, Japan
Professor Philippe Taquet, France
Professor Hugh S. Torrens, United Kingdom
Professor Zbigniew Wójcik, Poland

APPENDIX D

NEW MEMBERS FOR 2019 OM = Ordinary Membership; AM = Associate membership
List of New Members, 2019 (elected) (Total of 13 nominations from 7 countries).

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Appendix F

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Scientific Publications (summary in 1-3 lines):

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APPENDIX G

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POLISH GEOLOGICAL SOCIETY

46nd INTERNATIONAL COMMISSION ON THE HISTORY OF GEOLOGICAL SCIENCES (INHIGEO) SYMPOSIUM

CRACOW, POLAND, 18-24 JULY 2021

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